

October 2023

# **Rule 34 Registration: Volume 2**

## **Ranger Recycling Facility & Containment**

### **Section 22 T20S, R33E, Lea County**

***C-147 Form***

***Stamped Design Drawing, Liner Equivalency Demonstration, &  
Avian deterrent System***

***Plans for: Design/Construction, O&M, Closure***



*Looking north from the southeast corner of the Ranger RF site.*

**Prepared for:**  
**Ranger Water, LLC**  
**Lovington, New Mexico**

**Prepared by:**  
**R.T. Hicks Consultants, Ltd.**  
**901 Rio Grande NW F-142**  
**Albuquerque, New Mexico**

**Cascade Services, LLC**  
**4400 N Big Spring Street #114**  
**Midland, TX 79705**

C-147

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
811 S. First St., Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural Resources  
Department  
Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-147  
Revised April 3, 2017

## Recycling Facility and/or Recycling Containment

Type of Facility: ☒ Recycling Facility ☒ Recycling Containment\*  
Type of action: ☐ Permit ☒ Registration  
☐ Modification ☐ Extension  
☐ Closure ☐ Other (explain) \_\_\_\_\_

\* At the time C-147 is submitted to the division for a Recycling Containment, a copy shall be provided to the surface owner.

Be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, ground water or the environment. Nor does approval relieve the operator of its responsibility to comply with any other applicable governmental authority's rules, regulations or ordinances.

1.  
Operator: Ranger Water, LLC OGRID #: 332067  
Address: PO Box 1244, Lovington, NM 88260  
Facility or well name (include API# if associated with a well): Ranger RF and Containments  
OCD Permit Number: 1RF-512 (For new facilities the permit number will be assigned by the district office)  
U/L or Qtr/Qtr: H&I Section: 22 Township: 20S Range: 33E County: Lea  
Surface Owner: ☐ Federal ☐ State ☒ Private ☐ Tribal Trust or Indian Allotment

2.  
☒ **Recycling Facility:**  
Location of (if applicable): Latitude: 32.55352 N Longitude: 103.64473 W approximately (NAD83)  
Proposed Use: ☒ Drilling\* ☒ Completion\* ☒ Production\* ☒ Plugging\*  
**\*The re-use of produced water may NOT be used until fresh water zones are cased and cemented**  
☐ Other, requires permit for other uses. Describe use, process, testing, volume of produced water and ensure there will be no adverse impact on groundwater or surface water.  
☒ Fluid Storage  
☐ Above ground tanks ☒ Recycling containment ☐ Activity permitted under 19.15.17 NMAC explain type \_\_\_\_\_  
☐ Activity permitted under 19.15.36 NMAC explain type: \_\_\_\_\_ ☐ Other explain \_\_\_\_\_  
☐ For multiple or additional recycling containments, attach design and location information of each containment  
☐ **Closure Report (required within 60 days of closure completion):** ☐ Recycling Facility Closure Completion Date: \_\_\_\_\_

3.  
☒ **Recycling Containment:**  
☐ Annual Extension after initial 5 years (attach summary of monthly leak detection inspections for previous year)  
Center of Recycling Containment (if applicable) Latitude: 32.55352 N Longitude: 103.64473 W approx. (NAD83)  
☐ For multiple or additional recycling containments, attach design and location information of each containment  
☒ Lined ☐ Liner type: Thickness See Attached Engineer Drawings ☐ LLDPE ☒ HDPE ☐ PVC ☐ Other  
☐ String-Reinforced  
Liner Seams: ☐ Welded ☐ Factory ☐ Other Volume: 1,016k bbl with 3' freeboard Dimensions 966'x 466' x up to 21'  
☐ Recycling Containment Closure Completion Date: \_\_\_\_\_ See Attached Design Drawings





9.

**Recycling Facility and/or Containment Checklist:****Instructions:** Each of the following items must be attached to the application. Indicate, by a check mark in the box, that the documents are attached.

- ☒ Design Plan - based upon the appropriate requirements.
- ☒ Operating and Maintenance Plan - based upon the appropriate requirements.
- ☒ Closure Plan - based upon the appropriate requirements.
- ☒ Site Specific Groundwater Data -
- ☒ Siting Criteria Compliance Demonstrations -
- ☒ Certify that notice of the C-147 (only) has been sent to the surface owner(s)

10.

**Operator Application Certification:**

I hereby certify that the information and attachments submitted with this application are true, accurate and complete to the best of my knowledge and belief.

Name (Print): Taylor Mitchell Title: CEOSignature: Taylor Mitchell Date: 11.3.23e-mail address: ~~taylor@mitchell~~ Telephone: 225-279-0669taylor@deep river resources.com

11.

OCD Representative Signature: Victoria Venegas Approval Date: 11/30/2023Title: Environmental Specialist OCD Permit Number: 1RF-512☒ OCD Conditions \_\_\_\_\_☒ Additional OCD Conditions on Attachment

RECYCLING CONTAINMENT DESIGN DRAWINGS

ALTERNATIVE LINER EQUIVALENCY  
DEMONSTRATION

AVIAN DETERRENT SYSTEM

32° 33' 12.6822"N, 103° 38' 41.0352"W  
32.553523°, -103.644732°



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SERVICES

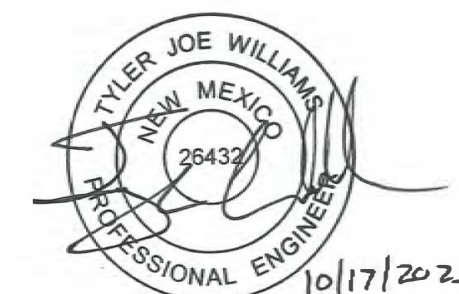
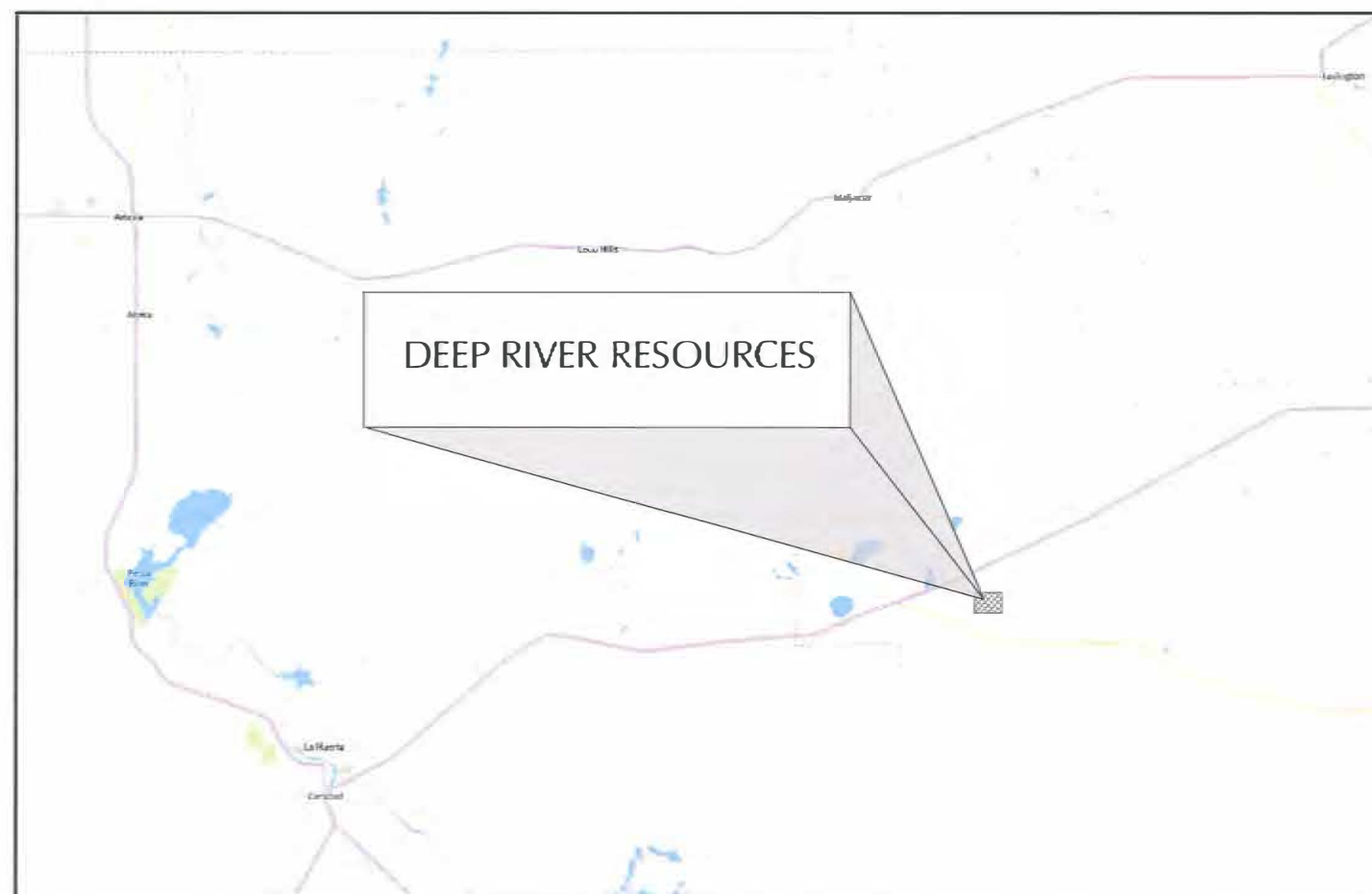
# INDEX TO DRAWINGS

## 11X17

SHEET NO.	DESCRIPTION
1.	COVER SHEET
2.	PROJECT LOCATION
3.	SITE PLAN
4.	PIT CAPACITY
5.	FENCE PLAN
6.	CROSS SECTIONS
7.	CROSS SECTIONS
8.	LEAK DETECTION DETAILS
9.	LINER DETAILS
10.	FENCE DETAILS

## CONTACTS

TAYLOR MITCHELL - DEEP RIVER RESOURCES - (225) 279-0669  
BOBBY JO CRAIN - CASCADE SERVICES - (210) 632-8670  
ENVIROTECH ENGINEERING & CONSULTING - MITCHELL RATNE, EIT (580)-234-8780  
(DESIGN ENGINEER)  
ENVIROTECH ENGINEERING & CONSULTING - DOUG SCHRANTZ, PE (580)-234-8780  
(SUPERVISING ENGINEER)



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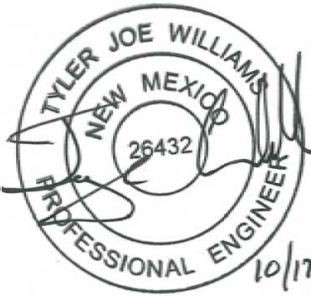
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NO.	DATE	DESCRIPTION

DEEP RIVER RESOURCES

PROJECT LOCATION

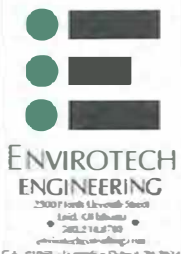
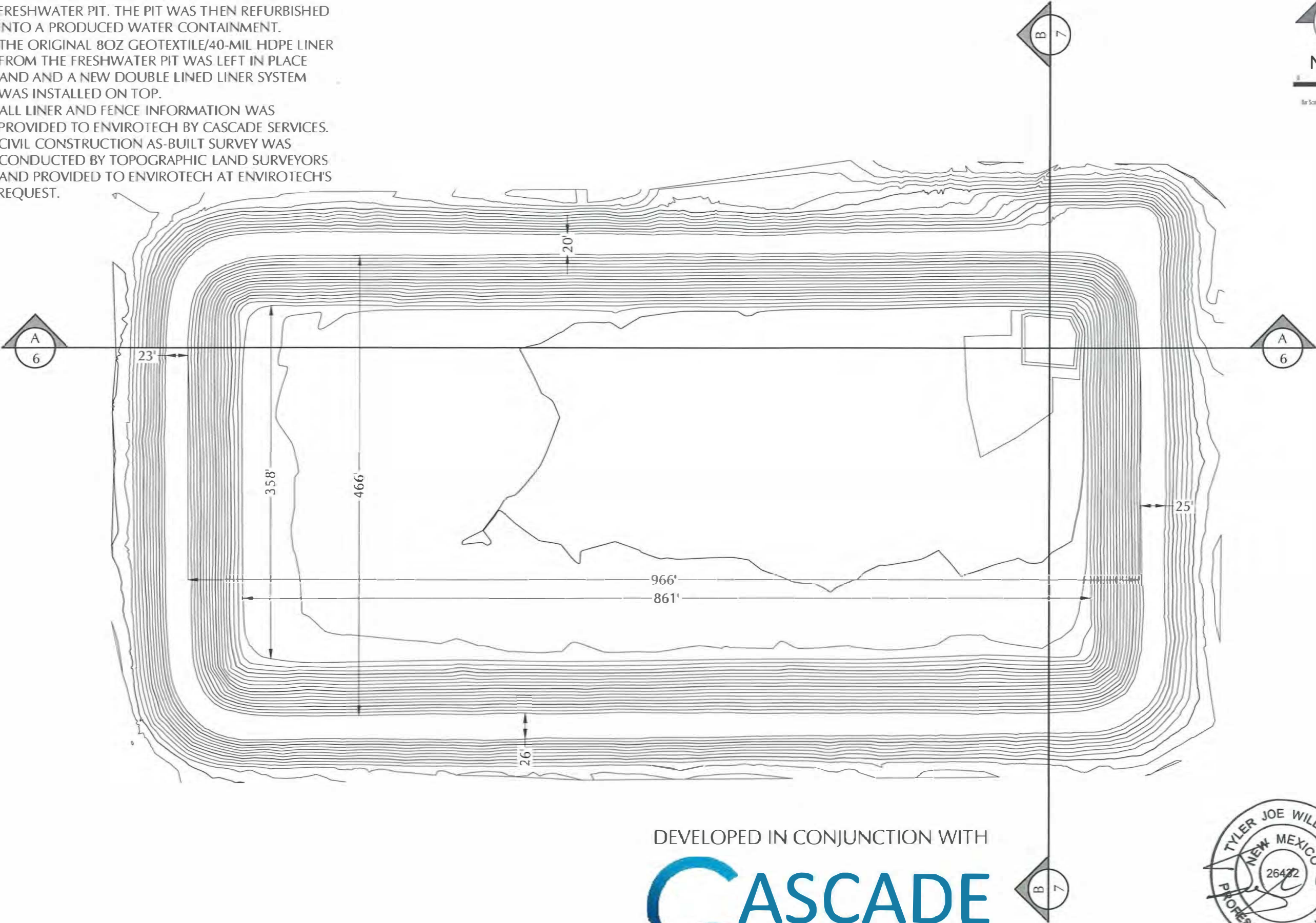
RANGER PIT  
DEEP RIVER RESOURCES  
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 33 EAST



DEVELOPED IN CONJUNCTION WITH



- REMARKS
1. THIS FACILITY WAS ORIGINALLY BUILT AS A FRESHWATER PIT. THE PIT WAS THEN REFURBISHED INTO A PRODUCED WATER CONTAINMENT.
  2. THE ORIGINAL 80Z GEOTEXTILE/40-MIL HDPE LINER FROM THE FRESHWATER PIT WAS LEFT IN PLACE AND A NEW DOUBLE LINED LINER SYSTEM WAS INSTALLED ON TOP.
  3. ALL LINER AND FENCE INFORMATION WAS PROVIDED TO ENVIROTECH BY CASCADE SERVICES.
  4. CIVIL CONSTRUCTION AS-BUILT SURVEY WAS CONDUCTED BY TOPOGRAPHIC LAND SURVEYORS AND PROVIDED TO ENVIROTECH AT ENVIROTECH'S REQUEST.



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NO.	DATE	DESCRIPTION

**DEEP RIVER RESOURCES**

**SITE PLAN**  
RANGER PIT  
DEEP RIVER RESOURCES  
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 33 EAST

DATE:	OCTOBER 2023
SCALE:	1" = 100'
DESIGNED BY:	OTHERS
DRAWN BY:	M. RATKE
CHECKED BY:	D. SCHWARTZ
PROJECT NO.	023123-00
SHEET NO.	3 of 10

DEVELOPED IN CONJUNCTION WITH  
**CASCADE**  
SERVICES



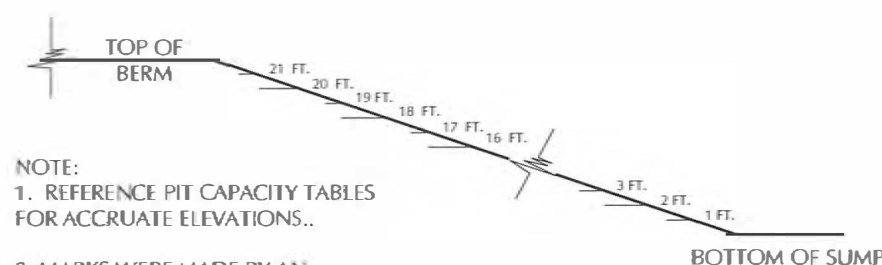




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Lagoon Liq Depth ft	Storage ft	Remaining Stor Vol ft3	Gallons Storage gal	BBIS Storage bbls	Percent of Total Volume %	Vol in lagoon ft³	Gallons Storage gal	Vol in Lagoon bbls	Vol in Lagoon ac-ft	Percent Total Vol %
21.0	0.0	-	-	-	0.0%	6,578,209	49,271,583	1,171,704	151.01	100%
20.0	1.0	685,952	3,299,431	78,357.9	10.4%	6,137,168	45,912,152	1,093,146	140.80	93%
19.0	2.0	1,358,431	6,534,054	155,572.7	20.7%	5,704,789	42,677,529	1,016,132	130.96	87%
18.0	3.0	2,017,535	9,704,344	231,055.8	30.7%	5,281,010	39,507,239	940,649	121.24	80%
17.0	4.0	2,663,399	12,810,951	305,022.6	40.5%	4,865,744	36,400,632	866,682	111.70	74%
16.0	5.0	3,296,172	15,854,587	377,490.2	50.1%	4,458,895	33,356,996	794,214	102.36	68%
15.0	6.0	3,915,935	18,835,648	448,467.8	59.5%	4,060,411	30,375,935	723,237	93.21	62%
14.0	7.0	4,522,806	21,754,697	517,969.0	68.8%	3,670,216	27,456,886	653,735	84.26	56%
13.0	8.0	5,116,956	24,612,560	586,013.3	77.8%	3,288,200	24,599,023	585,691	75.49	50%
12.0	9.0	5,698,517	27,409,868	652,615.9	86.6%	2,914,278	21,801,715	519,088	66.90	44%
11.0	10.0	6,267,523	30,146,785	717,780.6	95.3%	2,548,429	19,064,798	453,924	58.50	39%
10.0	11.0	6,823,940	32,823,151	781,503.6	103.7%	2,190,674	16,388,432	390,201	50.29	33%
9.0	12.0	7,367,835	35,439,286	843,792.5	112.0%	1,840,970	13,772,297	327,912	42.26	28%
8.0	13.0	7,899,149	37,994,906	904,640.6	120.1%	1,499,355	11,216,677	267,064	34.42	23%
7.0	14.0	8,417,534	40,488,339	964,008.1	128.0%	1,166,053	8,723,244	207,696	26.77	18%
6.0	15.0	8,922,203	42,915,797	1,021,804.7	135.6%	841,570	6,295,786	149,900	19.32	13%
5.0	16.0	9,411,779	45,270,655	1,077,872.7	143.1%	526,792	3,940,928	93,832	12.09	8%
4.0	17.0	9,866,070	47,455,795	1,129,899.9	150.0%	234,700	1,755,788	41,804	5.39	4%
3.0	18.0	10,175,856	48,945,866	1,165,377.8	154.7%	35,519	265,717	6,327	0.82	1%
2.0	19.0	10,217,376	49,145,579	1,170,132.8	155.3%	8,823	66,005	1,572	0.20	0%
1.0	20.0	10,226,967	49,191,712	1,171,231.2	155.5%	2,656	19,871	473	0.06	0%
0.0	21.0	10,231,098	49,211,583	1,171,704.4	155.5%	-	-	-	-	0%



NOTE:  
1. REFERENCE PIT CAPACITY TABLES  
FOR ACCURATE ELEVATIONS..

2. MARKS WERE MADE BY AN EXTRUSION WELDER USING BLACK FILAMENT..

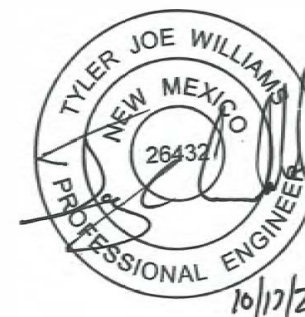
3. MARKS BEGIN AT THE TOP OF BERM AND CONTINUE TO THE BOTTOM OF THE SUMP. (TOP OF BERM SHOULD READ 21-FT, BOTTOM OF SUMP +1-FT SHOULD READ 1-FT)

WATER LEVEL MARKS  
Not to Scale

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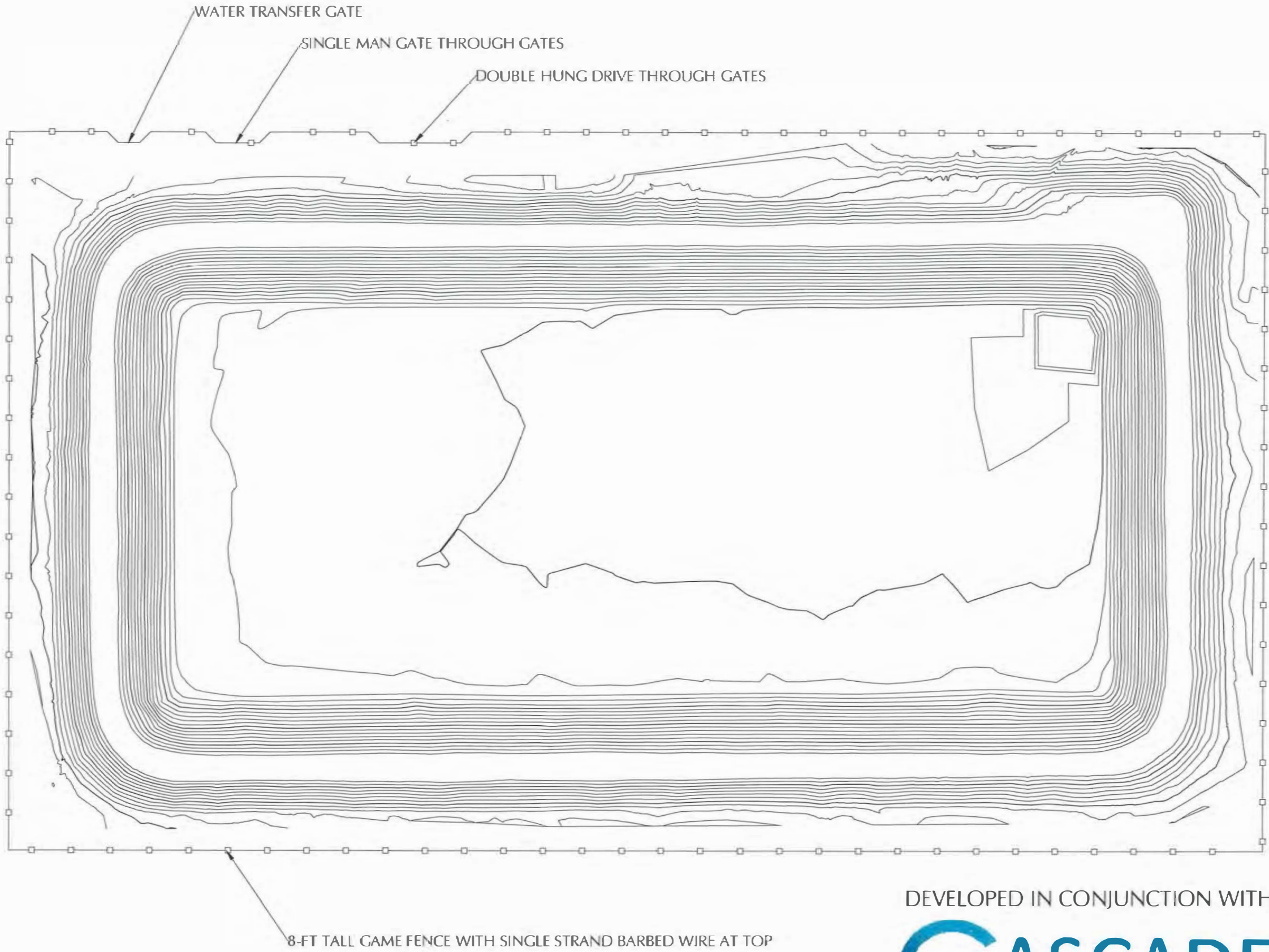


## DEEP RIVER RESOURCES

**PIT CAPACITY**  
**RANGER PIT**  
**DEEP RIVER RESOURCES**  
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 33 EAST

DATE:	OCTOBER 2023
SCALE:	1" = 30'
DESIGNED BY:	OTHERS
DRAWN BY:	M. RATKE
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	023123-00
SHEET NO.	





  
**ENVIROTECH  
ENGINEERING**  
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703.214.8700  
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NO.	DATE	DESCRIPTION

**DEEP RIVER RESOURCES**

**FENCE PLAN**  
RANGER PIT  
DEEP RIVER RESOURCES  
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 33 EAST



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SERVICES

DATE:	OCTOBER 2023
SCALE:	1" = 100'
DESIGNED BY:	OTHERS
DRAWN BY:	M. RATRE
CHECKED BY:	D. SCHIRANTZ
PROJECT NO.	023123-00
SHEET NO.	5 of 10



**ENVIROTECH**  
ENGINEERING  
2500 Foothills Drive, Suite 100  
Fort Collins, CO 80526  
970.224.8700  
envirotechengineering.com  
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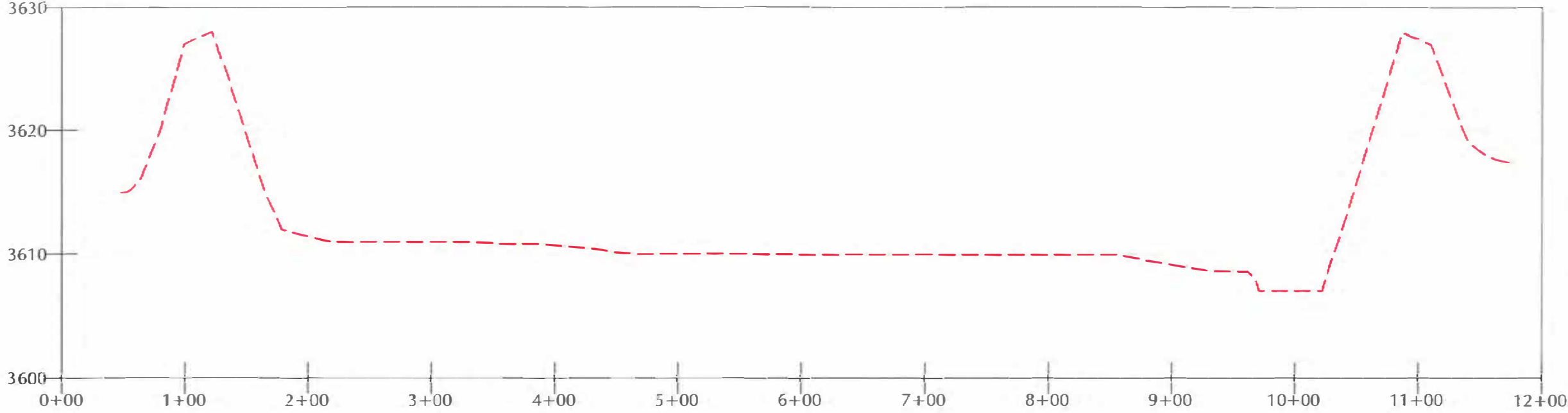
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NO.	DATE	DESCRIPTION

**DEEP RIVER RESOURCES**

**CROSS SECTIONS**  
RANGER PIT  
DEEP RIVER RESOURCES  
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 33 EAST

DATE:	OCTOBER 2023
SCALE:	VERTICAL 1" = 10' HORIZONTAL 1/2" = 100'
DESIGNED BY:	OTHERS
DRAWN BY:	AL. RATKE
CHECKED BY:	D. SCHRAMTZ
PROJECT NO.	023123-00
SHEET NO.	6 of 10



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TYLER JOE WILLIAMS  
NEW MEXICO  
26432  
PROFESSIONAL ENGINEER

10/17/2023



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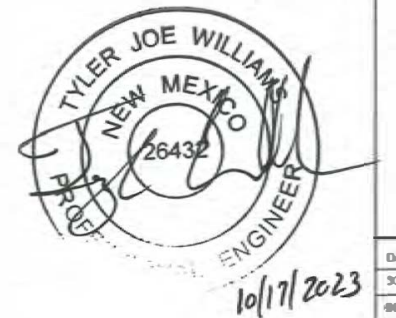
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## DEEP RIVER RESOURCES

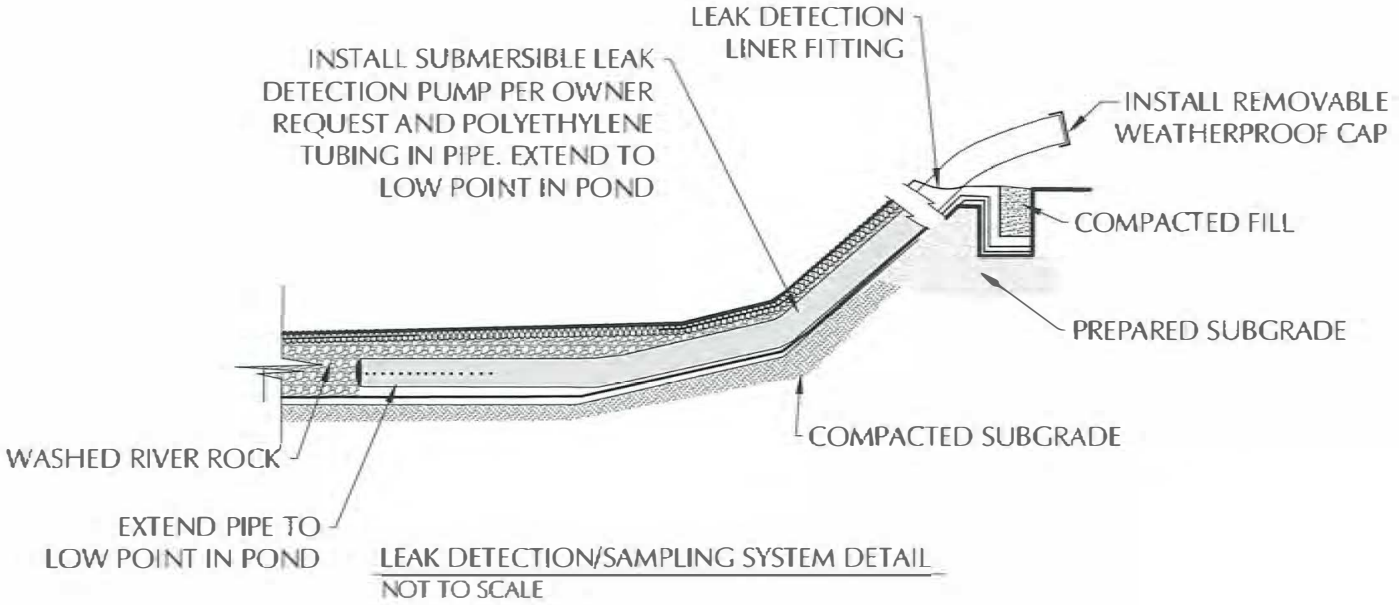
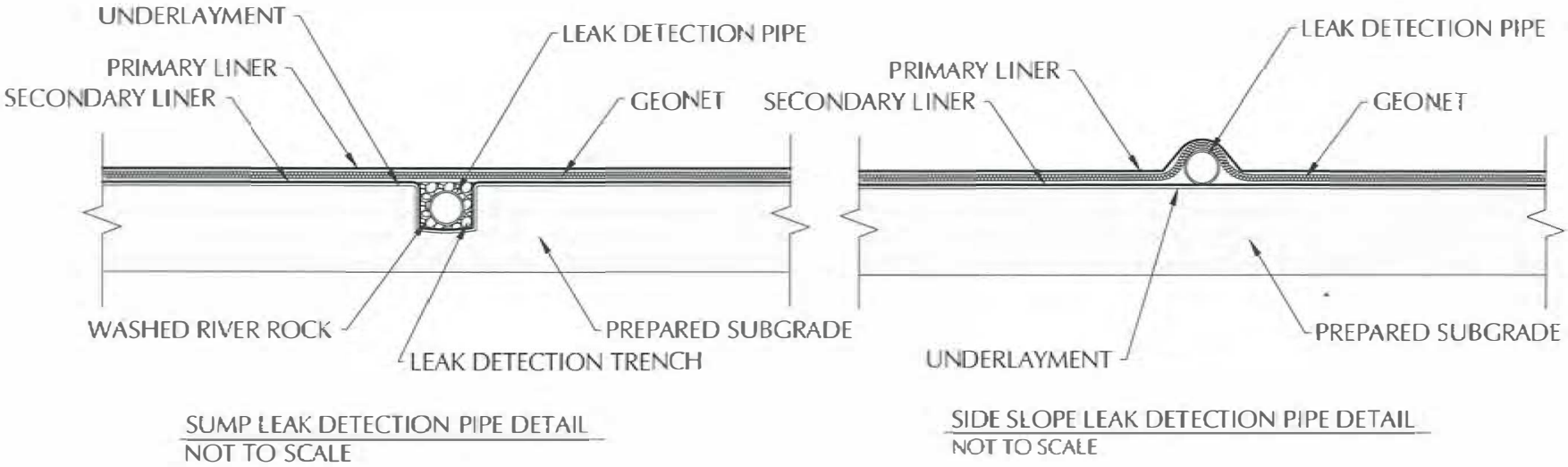
CROSS SECTIONS  
RANGER PIT  
DEEP RIVER RESOURCES  
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 33 EAST

DATE: OCTOBER 2023  
VERTICAL 1" = 10'  
SCALE HORIZONTAL 1" = 100'  
DESIGNED BY: OTHERS  
DRAWN BY: M. RATKE  
CHECKED BY: D. SCHRANZ  
PROJECT NO. 0231.23-00  
SHEET NO. 7 of 10

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PROPOSED PIT REFERENCE TABLE	
DETAIL	DESCRIPTION
PRIMARY LINER	60-MIL HDPE SMOOTH LINER
LEAK DETECTION	200-MIL GEONET
SECONDARY LINER	40-MIL HDPE SMOOTH LINER
UNDERLAYMENT	EXISTING 8OZ GEOTEXTILE/40-MIL HDPE LINER
SUMP	3607.0-FT ELEVATION
BERM (ROAD CREST)	DESIGN ELEV. 3628.0-ft - RD CREST VARIES (23'-26')
LEAK DETECTION PIPING	6-IN PERFORATED HDPE PIPE LEAK DETECTION PIPE

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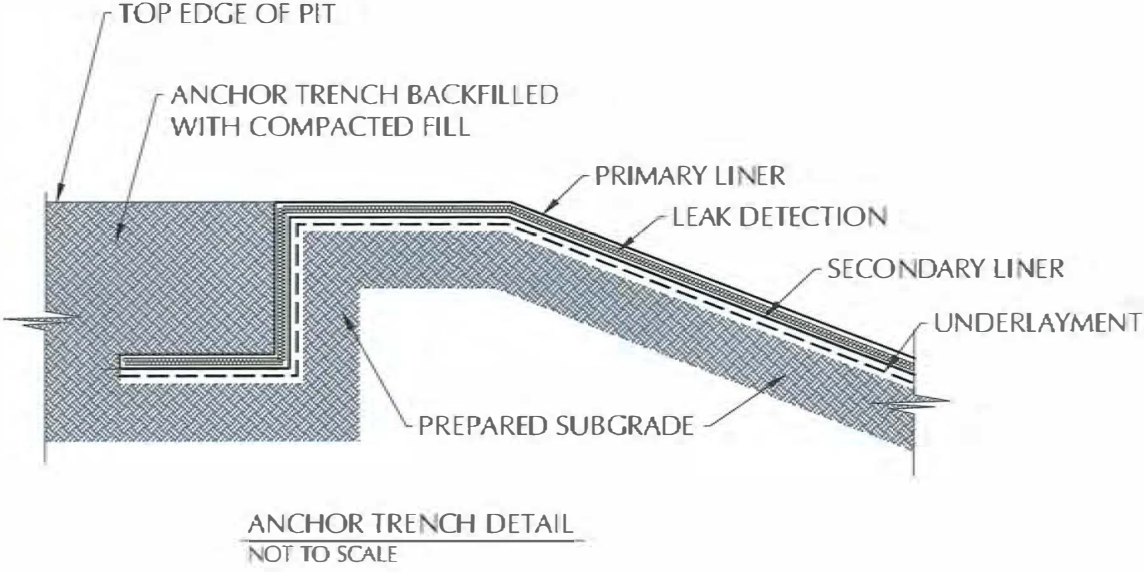
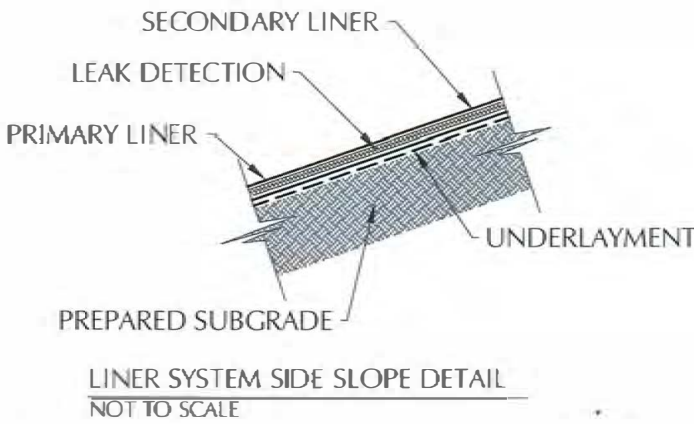
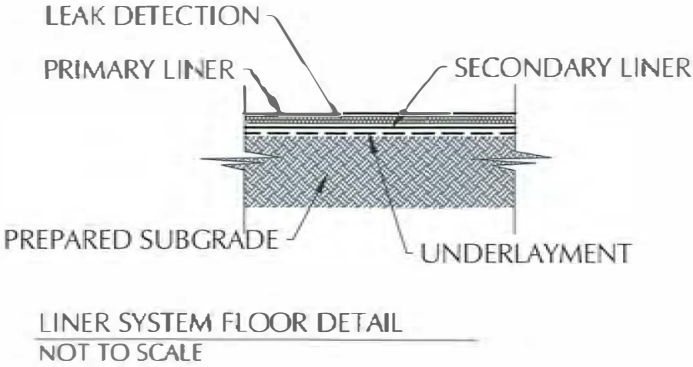
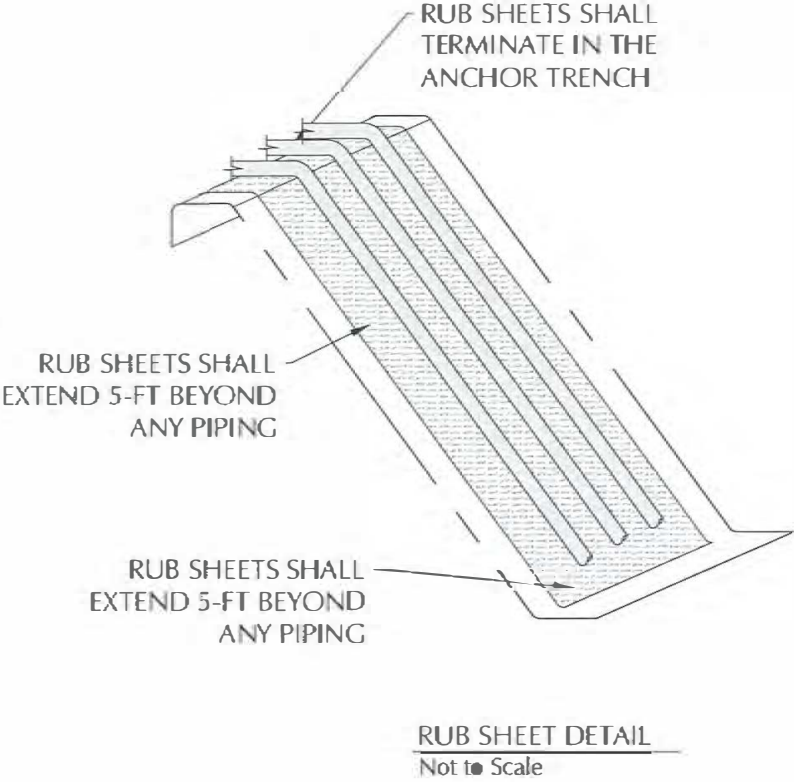


DEEP RIVER RESOURCES

LEAK DETECTION DETAILS  
RANGER PIT  
DEEP RIVER RESOURCES  
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 33 EAST

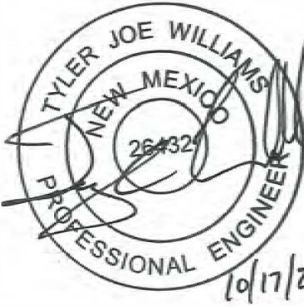
DATE:	OCTOBER 2023
SCALE:	NOT TO SCALE
DESIGNED BY:	OTHERS
DRAWN BY:	ML RATHB
CHECKED BY:	D. SCHRAMTZ
PROJECT NO.	023123 000
SHEET NO.	8 of 10





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Phone: (918) 438-1111  
www.envirotech-engineering.com  
E.C. 45948 - Expires 03/31/2024

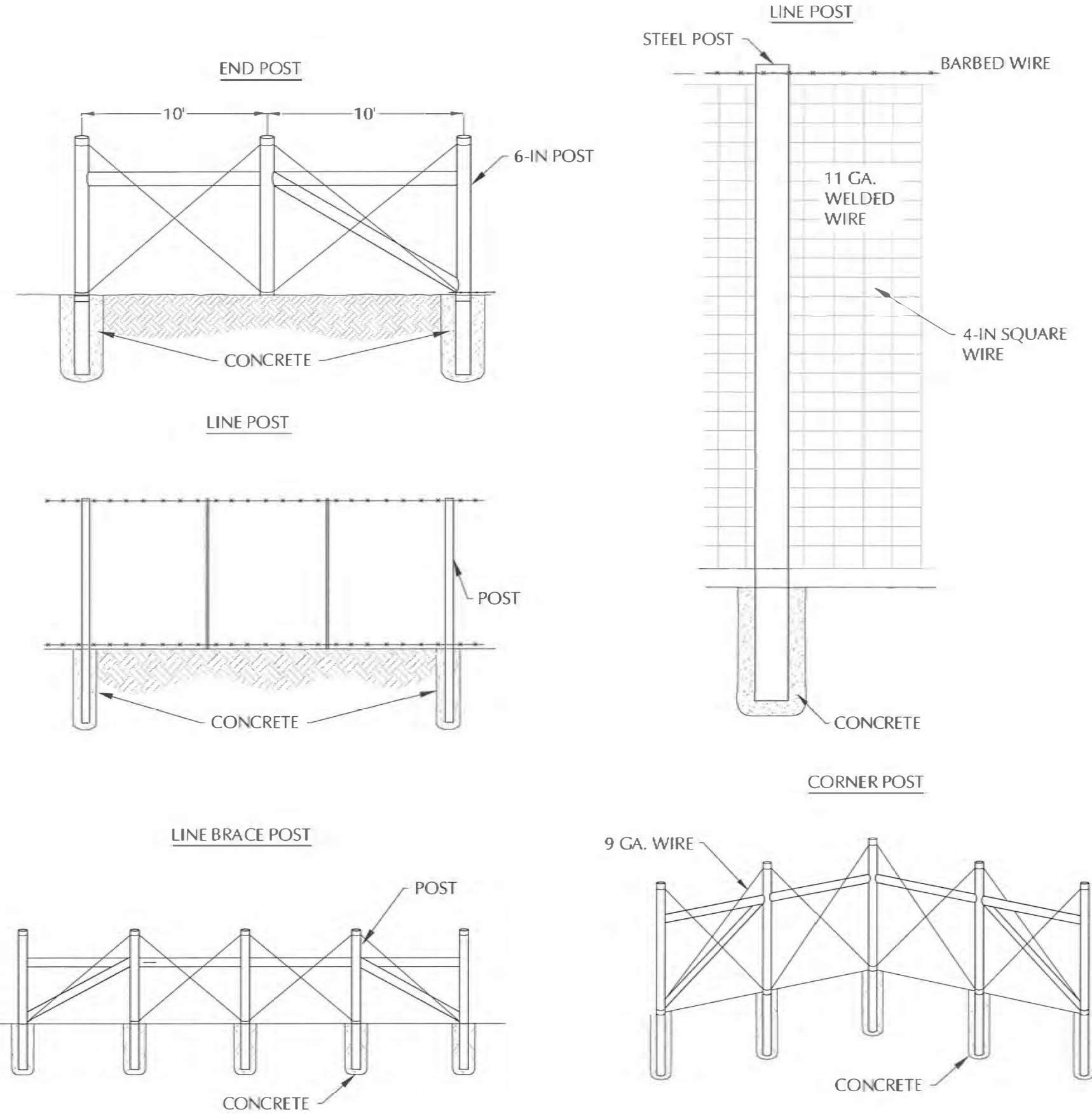
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NO.	DATE	DESCRIPTION

**DEEP RIVER RESOURCES**

**LINER DETAILS**  
RANGER PIT  
DEEP RIVER RESOURCES  
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 13 EAST

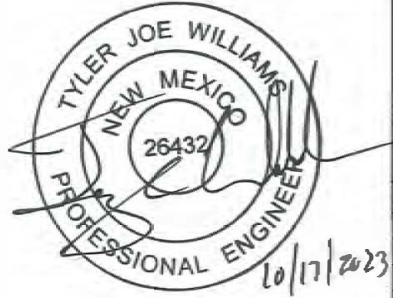
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SCALE:	NOT TO SCALE
DESIGNED BY:	OTHERS
DRAWN BY:	ML RATKE
CHECKED BY:	D. SCHRAMTZ
PROJECT NO.	023123-00
SHEET NO.	9 of 10



- FENCE NOTES:
1. FENCE INFORMATION PROVIDED TO ENVIROTECH BY CASCADE SERVICES VIA EMAIL.
  2. AT EACH LOCATION WHERE AN ELECTRIC TRANSMISSION, DISTRIBUTION OR SECONDARY LINE CROSSES A BARRIER FENCE, THE CONTRACTOR SHALL FURNISH AND INSTALL A GROUND CONFORMING TO ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE- THE GROUND ROD SHALL BE A MINIMUM DIAMETER OF 1/2-IN. AND 8-FT. IN LENGTH, AND DRIVEN AT LEAST 7 1/2 FT. INTO THE GROUND. THE ROD SHALL BE CONNECTED TO EACH WIRE WITH A MINIMUM AWG NO. 8 STRANDED COPPER WIRE. GROUNDING WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.

DEVELOPED IN CONJUNCTION WITH

**CASCADE**  
SERVICES



ENVIROTECH  
ENGINEERING  
2500 North 41st Street  
Tulsa, Oklahoma  
74112-1418  
918-438-0000  
C.A. 177960 - 12 months (Date: 4-30-23)

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**DEEP RIVER RESOURCES**

**FENCE DETAILS**  
RANGER PIT  
DEEP RIVER RESOURCES  
SECTION 22, TOWNSHIP 20 SOUTH, RANGE 13 EAST

DATE:	OCTOBER 2023
SCALE:	NOT TO SCALE
DESIGNED BY:	OTHERS
DRAWN BY:	M. RATNE
CHECKED BY:	D. SCHRANTZ
PROJECT NO:	023123-00
SHEET NO:	10 of 10

**R.K. FROBEL & ASSOCIATES**  
*Consulting Engineers*

**Technical Memorandum: 40-mil HDPE as Alternative Secondary Liner System for In Ground Recycling Containment Facilities**  
**NMAC 19.15.34.12 A**

I have investigated the suitability of application for 40 mil HDPE geomembrane as an equivalent secondary liner to 30 mil scrim reinforced LLDPE (LLDPEr) in the application for In Ground Recycling Containment facilities. *In summary, it is my professional opinion that the specified 40 mil HDPE geomembrane will provide a secondary liner system that is equal to or better than 30 mil scrim reinforced LLDPEr and will provide the requisite protection of fresh water, public health and the environment for many years when engineering design provides requisite site/soil/slope preparation and when used in concert with requisite primary liners and drainage layers.*

It is understood that the lining system under discussion is composed of a 60 mil HDPE Primary liner, geonet drainage layer and a 40 mil HDPE Secondary liner. *In consideration of the secondary lining system application, size of impoundment and depth, design details as well as the chemical nature of typical processed water, it is my professional opinion that the 40 mil HDPE geomembrane will provide the requisite barrier against processed water loss and will function effectively as a secondary liner.*

The following are discussion points that hopefully will exhibit the equivalency of a 40 mil HDPE secondary liner to that of a 30 mil LLDPEr.

The nature and formulation of the 40 mil HDPE resin is the same as the Primary 60 mil HDPE. The major difference is that the 40 mil HDPE is lower in thickness (more flexible and less puncture resistant). However, in covered conditions, HDPE will resist aging and degradation and remain intact for many decades. In fact, a secondary liner of 40 mil HDPE will outlast an exposed 60 mil HDPE liner. According to the Geosynthetic Research Institute (GRI) study on lifetime prediction (GRI Paper No. 6), the half life of HDPE (GRI GM 13) exposed is > 36 years and the half-life of HDPE covered or buried is greater than 100 years. It is understood that in order to ensure compliance of materials, the primary 60 mil HDPE to be used must meet or exceed GRI GM 13 Standards. Likewise, the secondary liner that is not exposed to the same environmental and chemical conditions must meet or exceed GRI GM 13 for non-reinforced HDPE. Adhering to the minimum requirements of the GRI Specifications, 40 mil HDPE when used as a secondary liner will be equally as protective as the primary 60 mil HDPE liner (reference: [www.geosynthetic-institute.org/grispecs](http://www.geosynthetic-institute.org/grispecs)) and equally as protective as a 30 mil scrim reinforced LLDPEr liner.

Durability of Geomembranes is directly affected by exposure conditions. Buried or covered geomembranes are not affected by the same degradation mechanisms (UV, Ozone, Chemical, Stress, Temperature, etc) as are fully exposed geomembranes. In this regard, the secondary liner material and thickness can be much less robust than the fully exposed primary liner which in this case is 60 mil HDPE. This is also the case for



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landfill lining systems where the secondary geomembrane in a bottom landfill cell may be 40 mil HDPE.

Thermal Fusion Seaming Requirements. Thermal seaming and QC seam test requirements for geomembranes are product specific and usually prescribed by the sheet manufacturer. Dual wedge thermal fusion welding is commonly used on HDPE and QC testing by air channel (ASTM D 5820) is fully acceptable and recognized as an industry standard. In this regard, there should be no exception requirement for seaming and QC testing as both the Primary and Secondary geomembranes are HDPE. This is fully covered in comprehensive specifications for both the Primary and Secondary geomembranes (Reference: [www.ASTM.org/Standards](http://www.ASTM.org/Standards)).

Potential for Leakage through the Primary and Secondary Liners. Leakage through geomembrane liners is directly a function of the height of liquid head above any hole or imperfection. The geonet drainage media provides immediate drainage to a low point or sump and thus no hydrostatic head or driving gradient is available to push leakage water through a hole in the secondary liner. In this regard, secondary geomembrane materials can be (and usually are) much less in thickness and also polymer type. Hydraulic Conductivity through the 40 mil HDPE liner material is extremely low due to the polymer type, structure and crystallinity and exceeds requirements of EPA SW-846 Method 9090A.

Chemical Attack. Chemical attack to polymeric geomembranes is directly a function of type of chemical, temperature and exposure time. Again, the HDPE Primary provides the chemically resistant liner and is QC tested to reduce potential defects or holes. If there is a small hole, the geonet drain takes any leakage water immediately to the sump for extraction. Thus, exposure time is very limited on a secondary liner in addition to low temperature, little volume and virtually no head pressure. In this regard, a chemically resistant geomembrane material such as 40 mil HDPE can be specified for the secondary and is a fully acceptable alternate to 30 mil scrim reinforced LLDPEr.

Mechanical Properties Characteristics. Geomembranes of different polymer and/or structure (i.e., reinforced vs non-reinforced) cannot be readily compared using such characteristics as tensile stress/strain, tear, puncture and polymer requirements. For a 40 mil HDPE liner material to function as a Secondary liner it should meet or exceed the manufacturers minimum requirements for Density, Tensile Properties, Tear, Puncture as well as other properties such as UV resistance. The sheet material must also meet or exceed GRI GM 13 minimum requirements. *In this regard, a 40 mil HDPE will be equivalent to a 30 mil LLDPEr as a secondary liner for the conditions listed below:*

- *The subgrade or compacted earth foundation will be smooth, free of debris or loose rocks, dry, unyielding and will support the lining system.*
- *The side slopes for the containment shall be equal to or less than 3H:1V.*
- *The physical properties and condition of the subgrade or liner foundation*

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- (i.e., density, slope, moisture) will be inspected and certified by a Professional Engineer that it meets or exceeds specification requirements.
- Immediately prior to installation, the installation contractor shall inspect and sign off on the subgrade conditions that they meet or exceed the HDPE manufacturer and installers requirements.
  - A protective geotextile will be placed on the finished and accepted subgrade between subgrade and the 40 mil HDPE Secondary liner.
  - A 200 mil geonet will be placed over the 40 mil HDPE Secondary Liner.
  - A 60 mil HDPE Primary liner will be placed over the 200 mil geonet drainage layer.

If you have any questions on the above technical memorandum or require further information, give me a call at 720-289-0300 or email [geosynthetics@msn.com](mailto:geosynthetics@msn.com)

Sincerely Yours,

*RK Frobel*

Ronald K. Frobel, MSCE, PE



References:

NMAC 19.15.34.12 A DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT

Geosynthetic Research Institute (GRI) Published Standards and Papers 2017  
[www.geosynthetic-institute.org](http://www.geosynthetic-institute.org)

ASTM Geosynthetics Standards 2017  
[www.ASTM.org/Standards](http://www.ASTM.org/Standards)



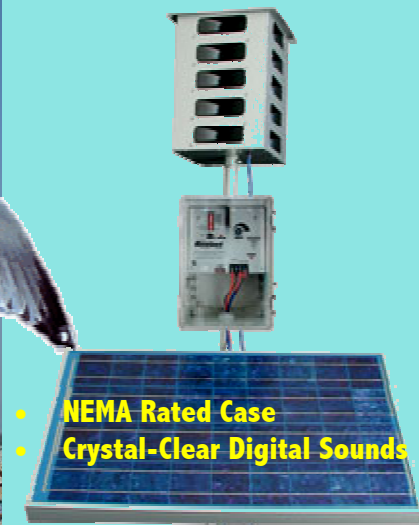
# EFFECTIVE WIDE-AREA BIRD CONTROL!

## Mega Blaster PRO sonic bird repeller covers 30 acres!



Mega Blaster PRO uses intermittent distress calls to create a "danger zone" that frightens infesting birds away for good.

PREDATOR cries help scare all the birds.



- NEMA Rated Case
- Crystal-Clear Digital Sounds

- Laughing Gull
- Ring-Billed Gull
- Herring Gull
- California Gull
- Black-Headed Gull
- Glaucous-Winged Gull
- Double Crested Cormorant
- Marsh Hawk

**Perfect for Landfills, Airfields, Fish Farms,  
Farm Fields or any multi-acre facility.**

Our most powerful system features two high-output amplifiers that drive our specially-designed 20 speaker tower. The intense sound output covers up to 30 acres (12 hectares).

It features solid-state electronics mounted inside a NEMA-type control box, suitable for most any application.

The generating unit mounts easily to a post or pole using the included hardware. The unit comes pre-recorded in four different configurations for the most common bird infestations.

Choose any or all of the 8 sounds, including predators to give the birds even more of a sense of danger. Customize by choosing volume and silent time between sounds.

### Mega Blaster PRO

Complete system includes the generating unit with two built-in high-output amplifiers, 20-speaker tower with audio cables, 40 watt solar panel, battery clips and all mounting hardware.

#### CONFIGURATIONS AVAILABLE:

- Agricultural  
# MEGA-AG
- Crow / Raven  
# MEGA-CROW
- Woodpecker  
# MEGA-WP
- Marine / Gull  
# MEGA-MAR



*The Bird Control 'X'-Perts*

**NOTE:** This unit is capable of sound output up to 125 decibels. **HEARING PROTECTION IS RECOMMENDED.**

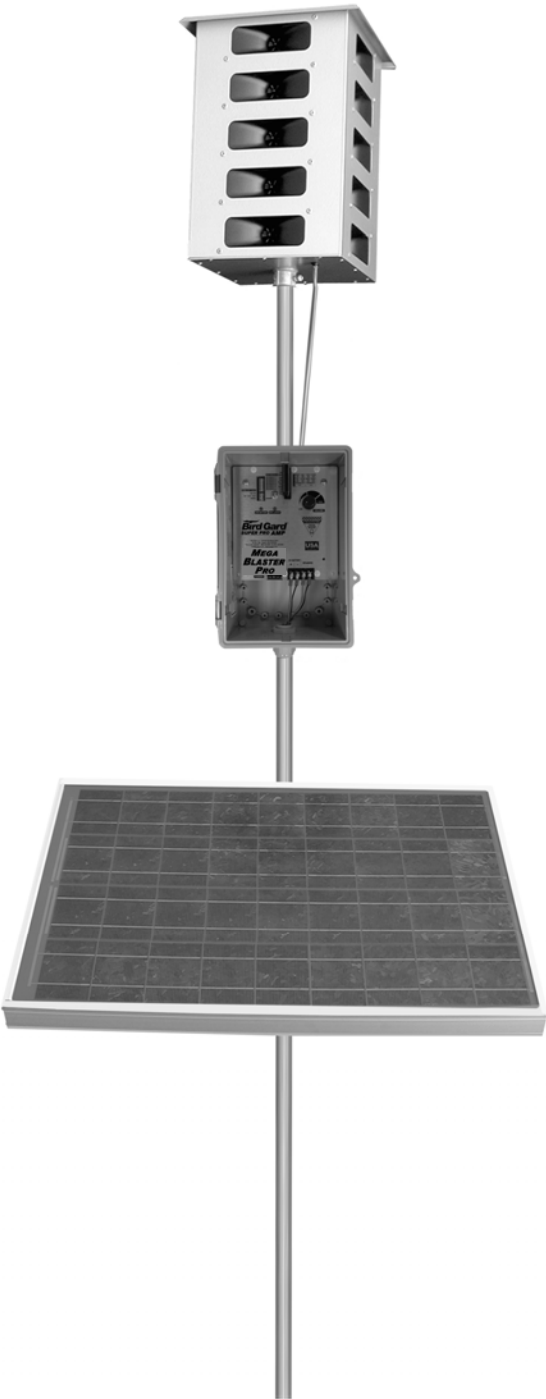


# MEGA BLASTER PRO



## User’s Manual

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# Overview

The Bird-X Mega Blaster Pro utilizes the innate power of the natural survival instincts of birds to effectively repel them. Digital recordings of distressed and alarmed birds, along with the sounds made by their natural predators are broadcast through high fidelity weather-resistant speakers over the top of areas. This action triggers a primal fear and flee response. Pest birds soon relocate to where they can feed without feeling threatened.

Your Bird-X Mega Blaster Pro system consists of:

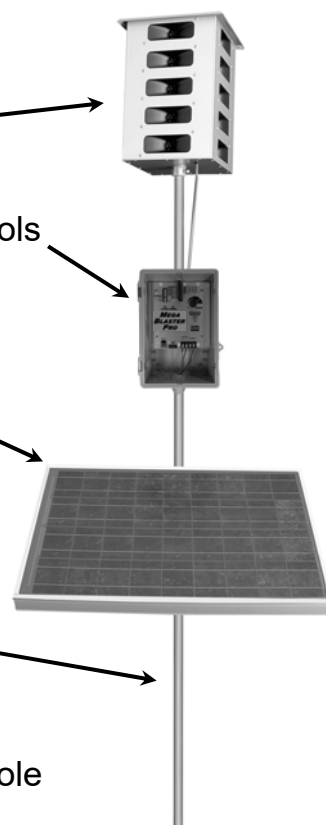
**20-Speaker Tower** broadcasts the bird sounds

**Control Unit** produces the bird sounds and contains all operational controls

**Solar Panel** recharges the 12-volt deep cycle battery

Items needed but not included:

- (1) **Mounting Pole or Mast** tall enough to raise the 20-Speaker Tower at least 5 feet above the top of the areas, trees or other obstructions
- (1) **12-volt Deep Cycle Battery** (RV/Marine) Group 27 or larger wet cell
- (1) **T-Post** or similar (Optional) may be needed to support the mounting pole
- (1) **Bailing Wire or zip-tie** (Optional) to secure the Mounting Pole to the T-Post



***CAUTION: THE MEGA BLASTER PRO IS CAPABLE OF PRODUCING SOUNDS UP TO 125 DECIBELS. PROPER HEARING PROTECTION MUST BE WORN ANYTIME THE UNIT IS TURNED ON.***



# Bird Control Management Guidelines

**An active bird control management program is a key to successfully repelling pest birds. Bird feeding patterns may take several days or weeks to break. Follow all suggestions for maximum effectiveness. Read all instructions prior to installation.**

## **For best results:**

- **It is extremely important to fully protect your entire area from birds.** Any areas not fully protected will allow birds to begin feeding at the fringes of the sound coverage. They will soon become bolder and learn the sounds are nothing to fear. This will cause the effectiveness to diminish. Complete Bird-X product coverage forces birds to leave the area entirely.
- Install the Mega Blaster Pro unit at least two weeks before birds are attracted to your area. It is much easier to keep birds away before they have found a food source than it is to repel them once they have developed a feeding pattern.
- Most birds begin feeding from the perimeter of an area. Place Mega Blaster Pro units so the sound protection covers past the edges of the area.
- Birds will often use tall trees for roosting and observation. If birds are in bordering trees it is necessary to position the units so the sound protection covers the trees as well.
- Mount the 20-Speaker Tower at least five feet above trees, areas and structures for maximum coverage. The higher the better. Sound will disperse or reflect off structures or foliage. Mount control unit out of direct sun, if possible.
- When first installed, run Mega Blaster Pro units at FULL volume and on SHORT time off periods. This ensures maximum "bird stress" and creates a hostile environment.
- Watch for changes in bird activity and adjust the location of your Mega Blaster Pro unit if needed.
- **Check the battery and unit settings often to insure continuous bird control. Be certain that the system is not turned down or has a dead battery. Field hands or harvesters may turn down the volume.**
- Changing settings and switches often helps to prevent bird habituation. Periodically change the switch settings of the eight sounds (turning them ON or OFF). NEVER turn OFF the distress calls of the target birds you are trying to repel and always keep at least one predator bird sound turned ON.
- If different bird species enter the protected area and begin causing damage contact us immediately for an updated Sound Recording Card designed to repel the new invading birds.
- Remember that the Mega Blaster Pro system is a management tool, and should be used as part of your overall bird control strategy, sometimes in conjunction with other bird control techniques and devices.

**Be aware that under extreme drought or other adverse conditions, birds will disregard all deterrents and risks in order to survive**

## DESIGN/CONSTRUCTION PLAN



## Design and Construction Plan In Ground Containments

This plan addresses construction of the earthen containments.

Magrym Engineers is providing the design of the containment and their plans are presented in this submission.

### *Dike Protection and Structural Integrity*

The design and operation provide for the confinement of produced water, prevention of releases and prevention of overtopping due to wave action or rainfall. Additionally, the design prevents run-on of surface water as the containment is surrounded by an above-grade levee (a berm) and/or diversion ditch (between the levee and the soil stockpile) to prevent run-on of surface water.

### *Stockpile Topsoil*

Where topsoil is present, prior to constructing containment, the operator will strip and stockpile the topsoil for use as the final cover or fill at the time of closure.

### *Signage*

The operator will place an upright sign no less than 12 inches by 24 inches with lettering not less than two inches in height in a conspicuous place on the fence surrounding the containment. The sign is posted in a manner and location such that a person can easily read the legend. The sign will provide the following information:

- the operator's name,
- the location of the site by quarter-quarter or unit letter, section, township and range, and
- emergency telephone numbers

### *Fencing*

The operator will provide for a fence to enclose the recycling containment in a manner that deters unauthorized wildlife and human access. As specified in the design drawings, the operator will employ a chain-link or game fence. If required by the District Office, the operator will add four-strands of barbed wire to comply with the text of the Rule. Because feral pigs, javelina and deer are present in the area, a chain link or game fence is required in order to comply with Section 19.15.34.12 D.1 of the Rule because pigs will move beneath the lower strand of a 4-strand, 4-foot high barbed wire fence and deer will jump over. However, 19.15.34.12 D.2 requires "a four-foot fence that has at least four strands of barbed wire evenly spaced in the interval between one foot and four feet above ground level". Therefore, a barbed wire specification will be added to the game fence to avoid a variance if required by the OCD District Office.

19.15.34.12 A Design and Construction Specifications

(1). The operator shall design and construct a recycling containment to ensure the confinement of produced water, to prevent releases and to prevent overtopping due to wave action or rainfall.  
(8). The operator of a recycling containment shall design the containment to prevent run-on of surface water. The containment shall be surrounded by a berm, ditch or other diversion to prevent run-on of surface water

19.15.34.12 B. Prior to constructing containment, the operator shall strip and stockpile the topsoil for use as the final cover or fill at the time of closure

19.15.34.12 C. Signs.

The operator shall post an upright sign no less than 12 inches by 24 inches with lettering not less than two inches in height in a conspicuous place on the fence surrounding the containment. The operator shall post the sign in a manner and location such that a person can easily read the legend. The sign shall provide the following information: the operator's name, the location of the site by quarter-quarter or unit letter, section, township and range, and emergency telephone numbers

19.15.34.12 D. Fencing

(1) The operator shall fence or enclose a recycling containment in a manner that deters unauthorized wildlife and human access and shall maintain the fences in good repair. The operator shall ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.  
(2) Recycling containments shall be fenced with a four-foot fence that has at least four strands of barbed wire evenly spaced in the interval between one foot and four feet above ground level.

## Design and Construction Plan In Ground Containments

As stated in the O&M plan, the operator will ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.

### *Netting and Protection of Wildlife*

The perimeter game/chain-link fence will be effective in excluding stock and most terrestrial wildlife. If requested by the surface owner, the game fence can include a fine mesh from the base to 1 foot above the ground to exclude the small reptiles (e.g. dune sagebrush lizard).

The recycling containment will be protective of wildlife, including migratory birds through the implementation of an Avian Protection Plan, routine inspections and the perimeter fence.

The avian protection plan includes the use of a Bird-X Mega Blaster Pro<sup>1</sup> as a primary hazing program for avian species. The device will be equipped with sounds suitable for the Permian Basin environment. In addition to this sonic device, staff will routinely inspect the containment for the presence of avian species and, if detected, will use a blank cartridge or shell in a handgun, starter pistol or shotgun as additional hazing. Decoys of birds of prey may be placed on the game fence and other roosts around the open water to provide additional hazing.

The O&M plan calls for the operator to inspect for and, within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

### *Earthwork*

The containment will have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear. Geotextile is required under the liner when needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity.

This volume provides the stamped drawings for the containment with the following design/construction specifications:

- a) levee has inside grade no steeper than two horizontal feet to one vertical foot (2H: 1V).

#### 19.15.34.12 E Netting.

The operator shall ensure that a recycling containment is screened, netted or otherwise protective of wildlife, including migratory birds. The operator shall on a monthly basis inspect for and, within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

#### 19.15.34.12 A

(2) A recycling containment shall have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear. Geotextile is required under the liner when needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity...

## Design and Construction Plan In Ground Containments

- b) levee outside grade is no steeper than three horizontal feet to one vertical foot (3H: 1V)
- c) top of the levee is wide enough to install an anchor trench and provide adequate room for inspection and maintenance.
- d) The containment floor design calls for a slope toward the sump in the corner(s).

### *Liner and Drainage Geotextile Installation*

The containment has a primary (upper) liner and a secondary (lower) liner with a leak detection system appropriate to the site's conditions.

The primary (upper) liner is a geomembrane liner composed of an impervious, synthetic material that is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline solutions. It is 60-mil HDPE. The secondary liner is specified in the design drawings and is 40-mil HDPE or thicker and is equivalent to 30-mil LLDPE (in accordance with a previously approved variance) Liner compatibility meets or exceeds a subsequent relevant publication to EPA SW-846 method 9090A.

The recycling containment design has a leak detection system between the upper and lower geomembrane liners of 200-mil geonet to facilitate drainage. The leak detection system consists of a properly designed drainage and collection and removal system placed above the lower geomembrane liner in depressions and sloped to facilitate the earliest possible leak detection. The containment floor design calls for a slope toward the sump in the corner(s) of the containment, as shown in the design drawings. This slope combined with the highly transmissive geonet drainage layer provide for rapid leak detection.

The liners and drainage material will be installed consistent with the Manufacturer's specifications. In addition to any specifications of the Manufacturer, protocols for liner installation include measures to:

- i. minimizing liner seams and orient them up and down, not across, a slope of the levee.
- ii. use factory-welded seams where possible.
- iii. use field seams in geosynthetic material that are thermally seamed and prior to field seaming, overlap liners four to six inches.
- iv. minimize the number of field seams and comers and irregularly shaped areas.
- v. provide for no horizontal seams within five feet of the

19.15.34.12 A

(2) ...The operator shall construct the containment in a levee with an inside grade no steeper than two horizontal feet to one vertical foot (2H:1V). The levee shall have an outside grade no steeper than three horizontal feet to one vertical foot (3H:1V). The top of the levee shall be wide enough to install an anchor trench and provide adequate room for inspection and maintenance.

19.15.34.12 A

(3) Each recycling containment shall incorporate, at a minimum, a primary (upper) liner and a secondary (lower) liner with a leak detection system appropriate to the site's conditions.

19.15.34.12 A

(4) All primary (upper) liners in a recycling containment shall be geomembrane liners composed of an impervious, synthetic material that is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline solutions. All primary liners shall be 30-mil flexible PVC, 45-mil LLDPE string reinforced or 60-mil HDPE liners. Secondary liners shall be 30-mil LLDPE string reinforced or equivalent with a hydraulic conductivity no greater than  $1 \times 10^{-9}$  cm/sec. Liner compatibility shall meet or exceed the EPA SW-846 method 9090A or subsequent relevant publications.

19.15.34.12 A

(7) The operator of a recycling containment shall place a leak detection system between the upper and lower geomembrane liners that shall consist of 200-mil geonet or two feet of compacted soil with a saturated hydraulic conductivity of  $1 \times 10^{-5}$  cm/sec or greater to facilitate drainage. The leak detection system shall consist of a properly designed drainage and collection and removal system placed above the lower geomembrane liner in depressions and sloped to facilitate the earliest possible leak detection.

19.15.34.12 A

(5) The operator of a recycling containment shall minimize liner seams and orient them up and down, not across, a slope of the levee. Factory welded seams shall be used where possible. The operator shall ensure field seams in geosynthetic material are thermally seamed. Prior to field seaming, the operator shall overlap liners four to six inches...

## Design and Construction Plan In Ground Containments

- slope's toe.
- vi. use qualified personnel to perform field welding and testing.
- vii. avoid excessive stress-strain on the liner
- viii. The edges of all liners are anchored in the bottom of a compacted earth-filled trench that is at least 18 inches deep

At points of discharge into the lined earthen containment the pipe configuration effectively protects the liner from excessive hydrostatic force or mechanical damage during filling.

The design shows that at any point of discharge into or suction from the recycling containment, the liner is protected from excessive hydrostatic force or mechanical damage. External discharge or suction lines do not penetrate the liner.

Pumping from the containment to hydraulic fracturing operations is the responsibility of stimulation contractors. Typically, lines are permanently placed in the containment with floats attached to prevent damage to the liner system. The containment may be equipped with permanent HDPE stinger (supported by a sacrificial liner or geotextile) for withdrawal of fluid if the owner deems necessary during operations.

### *Leak Detection and Fluid Removal System Installation*

The leak detection system, contains the following design elements

- a. The 200-mil HyperNet Geonet drainage material between the primary and secondary liner that is sufficiently permeable to allow the transport of fluids to the observation ports (Appendix A).
- b. The containment floor is sloped towards the monitoring riser pipe to facilitate the earliest possible leak detection of the containment bottom. A pump may be placed in the observation port to provide for fluid removal.
- c. Piping will withstand chemical attack from any seepage, structural loading from stresses and disturbances from overlying water, cover materials, equipment operation or expansion or contraction (see Appendix A).

19.15.34.12 A

(5) ...The operator shall minimize the number of field seams and corners and irregularly shaped areas. There shall be no horizontal seams within five feet of the slope's toe. Qualified personnel shall perform field welding and testing.

19.15.34.12 A

(3) The edges of all liners shall be anchored in the bottom of a compacted earth-filled trench. The anchor trench shall be at least 18 inches deep.

19.15.34.12 A

(6) At a point of discharge into or suction from the recycling containment, the operator shall insure that the liner is protected from excessive hydrostatic force or mechanical damage. External discharge or suction lines shall not penetrate the liner.



## OPERATIONS AND MAINTENANCE PLAN

## CLOSURE PLAN

## Operation and Maintenance Plan In Ground Containments

### Overview

The operator will operate and maintain the lined earthen containment to contain liquids and solids (blow sand and minimal precipitates from the produced water) and maintain the integrity of the liner system in a manner that prevents contamination of fresh water and protects public health and the environment as described below. The purpose of the lined earthen containment is to facilitate recycling, reuse and reclamation of produced water derived from oil and gas wells. During periods when water for E&P operations is not needed, produced water will discharge to injection wells or to a pipeline for transfer to another recycling facility. The containment will not be used for the disposal of produced water or other oilfield waste.

The operation of the containment is summarized below.

- A. Produced water generated from nearby oil and gas wells is delivered to a treatment system located as indicated in the C-147.
- B. Unless specified in the transmittal letter, after treatment, the produced water discharges into the containment.
- C. When required, produced water is removed from the containment for E&P operations. At this time, produced water will be used for drilling beneath the freshwater zones (beneath surface casing), for well stimulation (e.g. hydraulic fracturing) and other E&P uses as approved by OCD.
- D. Whenever the maximum fluid capacity of the containment is reached, treatment and discharge to the containment ceases (see Freeboard and Overtopping Plan, below).
- E. The operator will keep accurate records and shall report monthly to the division the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148 (see attached example).
- F. The operator will maintain accurate records that identify the sources and disposition of all recycled water that shall be made available for review by the division upon request.

19.15.34.10 D

Recycling containments may not be used for the disposal of produced water or other oilfield wastes.

19.15.34.9 E

The operator of a recycling facility shall keep accurate records and shall report monthly to the division the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148.

19.15.34.9 F

The operator of a recycling facility shall maintain accurate records that identify the sources and disposition of all recycled water that shall be made available for review by the division upon request.

## Operation and Maintenance Plan In Ground Containments

- G. The containment shall be deemed to have ceased operations if less than 20% of the total fluid capacity is used every six months following the first withdrawal of produced water for use. The operator will report cessation of operations to the appropriate division district office. The appropriate division district office may grant an extension to this determination of cessation of operations not to exceed six months.

The operation of the lined earthen containment will follow the mandates listed below:

1. The operator will not discharge into or store any hazardous waste (as defined by 40 CFR 261 and NMAC 19.15.2.7.H.3) in the containments.
2. If the containment's primary liner is compromised above the fluid's surface, the operator will repair the damage or initiate replacement of the primary liner within 48 hours of discovery or seek an extension of time from the division district office.
3. If the primary liner is compromised below the fluid's surface, the operator will remove all fluid above the damage or leak within 48 hours of discovery, notify the division district office and repair the damage or replace the primary liner.
4. If any penetration of the containment liner is confirmed by sampling of fluid in the leak detection system (see Monitoring, Inspection, and Reporting Plan; below), the operator will:
  - a. Begin and maintain fluid removal from the leak detection/pump-back system,
  - b. Notify the district office within 48 hours (phone or email) of the discovery,
  - c. Identify the location of the leak, and
  - d. Repair the damage or, if necessary, replace the containment liner.
5. The operator will install, or maintain on site, an oil absorbent boom or other device to contain an unanticipated release and the operator will remove any visible layer of oil from the surface of the recycling containment.
6. The operator will report releases of fluid in a manner consistent with NMAC 19.15.29
7. The containment will be operated to prevent the collection of surface water run-on.

### 19.15.34.13 C

A recycling containment shall be deemed to have ceased operations if less than 20% of the total fluid capacity is used every six months following the first withdrawal of produced water for use. The operator must report cessation of operations to the appropriate division district office. The appropriate division district office may grant an extension to this determination of cessation of operations not to exceed six months.

### 19.15.34.13 B

(4) If the containment's primary liner is compromised above the fluid's surface, the operator shall repair the damage or initiate replacement of the primary liner within 48 hours of discovery or seek an extension of time from the division district office.

(5) If the primary liner is compromised below the fluid's surface, the operator shall remove all fluid above the damage or leak within 48 hours of discovery, notify the division district office and repair the damage or replace the primary liner.

### 19.15.34.13 B

(7) The operator shall install, or maintain on site, an oil absorbent boom or other device to contain an unanticipated release.

(1) The operator shall remove any visible layer of oil from the surface of the recycling containment.

### 19.15.34.8 A

(6) All releases from the recycling and re-use of produced water shall be handled in accordance with 19.15.29 NMAC.

## Operation and Maintenance Plan In Ground Containments

8. The operator will maintain the containment free of miscellaneous solid waste or debris.
9. The operator will maintain at least three feet of freeboard for the containment and will use a free-standing staff gauge to allow easy determination of the required 3-foot of freeboard.
10. As described in the design/construction plan, the injection or withdrawal of fluids from the containment is accomplished through hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.
11. The operator shall ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.
12. The operator will maintain the fences in good repair.

### *Monitoring, Inspection, and Reporting Plan*

The operator will inspect the recycling containment and associated leak detection systems weekly while it contains fluids. The operator shall maintain a current log of such inspections and make the log available for review by the division upon request.

Weekly inspections consist of:

- reading and recording the fluid height of staff gauges,
- recording any evidence that the pond surface shows visible oil,
- visually inspecting the containment's exposed liners
- checking the leak detection system for any evidence of a loss of integrity of the primary liner.
- inspect diversion ditches and berms around the containment to check for erosion and collection of surface water run-on.
- inspect the leak detection system for evidence of damage or malfunction and monitor for leakage.

As stated above, if a liner's integrity is compromised, or if any penetration of the liner occurs, then the operator will take appropriate action within 48 hours, based on if above or below water surface, as noted above.

19.15.34.13

(6) The containment shall be operated to prevent the collection of surface water run-on.

19.15.34.13 B

(2) The operator shall maintain at least three feet of freeboard at each containment.

19.15.34.13 B

(3) The injection or withdrawal of fluids from the containment shall be accomplished through a header, diverter or other hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.

19.15.34.12 D

(1) The operator shall fence or enclose a recycling containment in a manner that deters unauthorized wildlife and human access and shall maintain the fences in good repair. The operator shall ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.

19.15.34.13 A

The operator shall inspect the recycling containment and associated leak detection systems weekly while it contains fluids. The operator shall maintain a current log of such inspections and make the log available for review by the division upon request.



## Operation and Maintenance Plan In Ground Containments

Monthly, the operator will:

- A. Inspect the containment for dead migratory birds and other wildlife. Within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.
- B. Report to the division the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148.
- C. Record sources and disposition of all recycled water.

The operator will maintain a log of all inspections and make the log available for the appropriate Division district office's review upon request. An example of the log is attached to this section of the permit application.

### *Freeboard and Overtopping Prevention Plan*

The method of operation of the containment allows for maintaining freeboard with very few potential problems. When the capacity of the containment is reached (3-feet of freeboard), the discharge of produced water ceases and the produced water generated by nearby oil and gas wells is managed by an injection well(s).

If rising water levels suggest that 3-feet of freeboard will not be maintained, the operator will implement one or more of the following options:

- I. Cease discharging produced water to the containment.
- II. Accelerate re-use of the produced water for purposes approved by the Division.
- III. Transfer produced water from the containment to injection wells.

The reading of the staff gauge typically occurs daily when treatment operations are ongoing and weekly when discharge to the containment is not occurring.

19.15.34.12 E

The operator shall on a monthly basis inspect for and, within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

19.15.34.9 E

The operator of a recycling facility shall keep accurate records and shall report monthly to the division the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148.

19.15.34.9 F

The operator of a recycling facility shall maintain accurate records that identify the sources and disposition of all recycled water that shall be made available for review by the division upon request.

## Operation and Maintenance Plan In Ground Containments

### *Protocol for Leak Detection Monitoring, Fluid Removal and Reporting*

As shown in Appendix A, the leak detection system includes a monitoring system. Any fluid released from the primary liner will flow to the collection sump, where fluid level monitoring is possible at the monitoring riser pipe associated with the leak detection system.

Staff may employ a portable electronic water level meter to determine if fluid exists in the monitoring riser pipe. Obtaining accurate readings of water levels in a sloped pipe beneath a containment can be a challenge. An electrician's wire snake may be required to push the probe to the bottom of the port and the probe may be fixed in a 2-inch pipe "dry housing" to avoid false readings due to water condensation on the pipe. There are many techniques to determine the existence of water in the sumps – including low flow pumps and a simple small bailer affixed to an electrician's snake. The operator will use the method that works best for this containment.

If seepage from the containment into the leak detection system is suspected by a positive fluid level measurement, the operator will:

1. Re-measure fluid levels in the monitoring riser pipe on a daily basis for one week to determine the rate of seepage.
2. Collect a water sample from the monitoring riser pipe to confirm the seepage is produced water from the containment via electrical conductivity and chloride measurements.
3. Notify NMOCD of a confirmed positive detection in the system within 48 hours of sampling (initial notification).
4. Install a pump into the monitoring riser pipe sump to continually (manually on a daily basis or via automatic timers) remove fluids from the leak detection system into the containment until the liner is repaired or replaced.
5. Dispatch a liner professional to inspect the portion of the containment suspected of leakage during a "low water" monitoring event.
6. Provide NMOCD a second report describing the inspection and/or repair within 20 days of the initial notification.

## Operation and Maintenance Plan In Ground Containments

If the point of release is obvious from a low water inspection, the liner professional will repair the loss of integrity. If the point of release cannot be determined by the inspection, the liner professional will develop a more robust plan to identify the point(s) of release. The inspection plan and schedule will be submitted to OCD with the second report. The operator will implement the plan upon OCD approval.

## Closure Plan In Ground Containments

### Overview

After operations cease, the operator will remove all fluids within 60 days and close the containment within six months from the date the operator ceases operations from the containment for use.

The operator shall substantially restore the impacted surface area to

- a. the condition that existed prior to the construction of the recycling containment or
- b. to a condition imposed by federal, state trust land or tribal agencies on lands managed by those agencies as these provisions govern the obligations of any operator subject to those provisions,

The surface owner will impose a closure design that conforms to their needs for the site. The operator understands that a variance will be submitted to OCD to allow for any alternative closure protocol.

### Excavation and Removal Closure Plan – Protocols and Procedures

The containment is expected to hold a small volume of solids, the majority of which will be windblown sand and dust with some mineral precipitates from the water

1. The operator will remove all liquids from the containment and either:
  - a. Dispose of the liquids in a division-approved facility, or
  - b. Recycle, reuse or reclaim the water for reuse in drilling and stimulation.
2. The operator will close the recycling containment by first removing all fluids, contents and synthetic liners and transferring these materials to a division approved facility.
3. After the removal of the containment contents and liners, soils beneath the containment will be tested by collection of a five-point (minimum) composite sample which includes stained or wet soils, if any, and that sample shall be analyzed for the constituents listed in Table I of 19.15.34.14.
4. After review of the laboratory results:
  - a. If any contaminant concentration is higher than the parameters listed in Table I, additional delineation may be required, and the operator must receive approval before proceeding with closure.

#### 19.15.34.14 A

Once the operator has ceased operations, the operator shall remove all fluids within 60 days and close the containment within six months from the date the operator ceases operations from the containment for use.

#### 19.15.34.14 E

The operator shall substantially restore the impacted surface area to the condition that existed prior to the construction of the recycling containment.

#### 19.15.34.14 G

The re-vegetation and reclamation obligations imposed by federal, state trust land or tribal agencies on lands managed by those agencies shall supersede these provisions and govern the obligations of any operator subject to those provisions, provided that the other requirements provide equal or better protection of fresh water, human health and the environment.

#### 19.15.34.14 B

The operator shall close a recycling containment by first removing all fluids, contents and synthetic liners and transferring these materials to a division approved facility.

#### 19.15.34.14 C

The operator shall test the soils beneath the containment for contamination with a five-point composite sample which includes stained or wet soils, if any, and that sample shall be analyzed for the constituents listed in Table I below.

#### 19.15.34.14 C

(1) If any contaminant concentration is higher than the parameters listed in Table I, the division may require additional delineation upon review of the results and the operator must receive approval before proceeding with closure.



## Closure Plan In Ground Containments

- b. If all contaminant concentrations are less than or equal to the parameters listed in Table I, then the operator will proceed to
  - i. backfill with non-waste containing, uncontaminated, earthen material - Or
  - ii. undertake an alternative closure process pursuant to a variance request after approval by OCD.

19.15.34.14 C

(2) If all contaminant concentrations are less than or equal to the parameters listed in Table I, then the operator can proceed to backfill with non-waste containing, uncontaminated, earthen material.

### Reclamation and Re-vegetation

- a. The operator will reclaim the containment's location to a safe and stable condition that blends with the surrounding undisturbed area.
- b. Topsoils and subsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns.
- c. The disturbed area shall then be reseeded in the first favorable growing season following closure of a recycling containment.

19.15.34.14 E

Once the operator has closed the recycling containment, the operator shall reclaim the containment's location to a safe and stable condition that blends with the surrounding undisturbed area. Topsoils and subsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns. The disturbed area shall then be reseeded in the first favorable growing season following closure of a recycling containment.

19.15.34.14 D

Within 60 days of closure completion, the operator shall submit a closure report on form C-147, including required attachments, to document all closure activities including sampling results and the details on any backfilling, capping or covering, where applicable. The closure report shall certify that all information in the report and attachments is correct and that the operator has complied with all applicable closure requirements and conditions specified in division rules or directives.

19.15.34.14 H

The operator shall notify the division when reclamation and re-vegetation are complete.

19.15.34.14 F

Reclamation of all disturbed areas no longer in use shall be considered complete when all ground surface disturbing activities at the site have been completed, and a uniform vegetative cover has been established that reflects a life-form ratio of plus or minus fifty percent (50%) of pre-disturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance levels, excluding noxious weeds.

### Closure Documentation

Within 60 days of closure completion, the operator shall submit a closure report on form C-147, including required attachments, to document all closure activities including sampling results and the details on any backfilling, capping or covering, where applicable. The closure report shall certify that all information in the report and attachments is correct and that the operator has complied with all applicable closure requirements and conditions specified in division rules or directives.

The operator shall notify the division when reclamation and re-vegetation are complete. Specifically the notice will document that all ground surface disturbing activities at the site have been completed, and a uniform vegetative cover has been established that reflects a life-form ratio of plus or minus fifty percent (50%) of pre-disturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance levels, excluding noxious weeds.

October 2023

# **Rule 34 Registration: Volume 1**

## **Lone Ranger RF & Containments**

### **Section 22 T20S, R33E, Lea County**

- *Transmittal Letter*
- *Siting Criteria Demonstration with Plates & Appendices*



*Aerial photograph of the Lone Ranger RF & Containments*

**Prepared for:**  
**Deep River Resources, LLC**  
**San Antonio, Texas**

**Prepared by:**  
**R.T. Hicks Consultants, Ltd.**  
**901 Rio Grande NW F-142**  
**Albuquerque, New Mexico**

**Cascade Services, LLC**  
**4400 N Big Spring Street #114**  
**Midland, TX 79705**

# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Since 1996

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November 9, 2023

Ms. Victoria Venegas  
NMOCD - District 2  
811 S. First St.  
Artesia, NM 88210  
Via E-Mail

RE: Ranger Water, LLC, Ranger RF & Containments Rule 34 Produced Water  
Containments, Section 22 T20S R33E, Lea County

Dear Ms. Venegas:

On behalf of Ranger Water, LLC and Cascade Services LLC, R.T. Hicks Consultants is pleased to submit a C-147 *permit registration* for the above-referenced project. Ranger Water has completed the construction of the 1,016,000 bbl. (max. liquid volume) Containment. Produced water will be flowing into the containment shortly after the submission of this registration.

Volume 1 of the C-147 package contains:

- this Transmittal Letter with a closure cost estimate
- a copy of the certified mail receipt to Mr. Coombes, the surface owner
- Siting Criteria Demonstration with attendant Plates and Appendices

Volume 2 is all material that OCD has previously approved:

- The C-147 Form
- Design/Construction Plan
- Operations & Maintenance Plan (updated) and Closure Plan (previously approved)
- Engineering Drawings and Liner Specifications
- Well Water Services Manual
- Variances for the Storage Containment

Ranger Water will transmit the registration package to OCD via the OCD.Online portal. In compliance with 19.15.34.10 of the Rule, this submission has been copied to Mr. Malcolm Coombes, the surface owner. If you have any questions or concerns regarding this permit or the attached C-147, please contact me. As always, we appreciate your work ethic and diligence.

Sincerely,  
R.T. Hicks Consultants



Randall T. Hicks PG  
Principal

Copy: Malcolm Coombes

# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Since 1996

## RANGER CONTAINMENT

### Financial Assurance Cost Estimate

Attached is the cost estimate for reclamation of the Lone Ranger RF and Containment.

Closure sampling and reporting will be conducted to “test the soils beneath the containment for contamination with a five-point composite sample which includes stained or wet soils, if any, and that sample shall be analyzed for the constituents listed in Table I” of Rule 34.

RT Hicks Consultants will conduct the sampling as necessary and prepare the Closure Report for the site. Closure costs associated with the sampling are estimated at \$7500. The cost estimates from Cascade Services (attached) and from RT Hicks Consultants are presented below.

#### *Cascade Services*

Reclam. Earthwork	222,400
Liner Removal	368,000
<b>Subtotal</b>	<b>590,000</b>
Est. Tax	0.00
<b>Total</b>	<b>590,400.00</b>

#### *RT Hicks Consultants*

Confirm. Sampling and	
Preparation of results and closure report	7500
Est. Tax	573.75
<b>Total</b>	<b>8073.75</b>

<b>Total for all Closure Activities</b>	<b>598,473.75</b>
---	-------------------

The reclamation must meet terms set forth in the surface lease agreement with the landowner, who received a copy of the registration.

Please contact Randall Hicks if you have any questions concerning this closure cost estimate.



Cascade Services, LLC

3403 E County Road 44  
Midland, TX 79705  
www.cascadeservicesllc.com



Estimate

ADDRESS	SHIP TO	ESTIMATE	1337
Deep River Resources LLC	Deep River Resources LLC	DATE	10/30/2023
		EXPIRATION	10/31/2023
		DATE	

CUSTOMER PROJECT NAME  
Ranger closure

DATE		DESCRIPTION	QTY	RATE	AMOUNT
	Civil Service	Push walls in flattening out pit	1	222,400.00	222,400.00
	Services	Remove and dispose of all four layers of liner	2,000,000	0.184	368,000.00

If pumping is needed due to weather conditions, a \$350 daily fee will be charged on final invoice.

This estimate does not include tax. Tax may be added based on agreement terms and installation location. unless customer provides a valid tax exemption document.

SUBTOTAL	590,400.00
TAX	0.00
TOTAL	\$590,400.00

Questions? Email AP@Cascadeservicesllc.com

Accepted By

Accepted Date

7022 3330 0002 0702 9972

U.S. Postal Service™ CERTIFIED MAIL® RECEIPT Domestic Mail Only	
For delivery information, visit our website at <a href="http://www.usps.com">www.usps.com</a> ®.	
Hobbs, NM 88240	
Certified Mail Fee	\$4.35
Extra Services & Fees (check box, add fee as appropriate)	
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$9.85
Total Postage and Fees	\$17.75
Sent To Malcolm Coombes	
Street and Apt. No., or PO Box No. 1015 N. Dal Paso	
City, State, ZIP+4® Hobbs, NM 88240	
PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions	

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11/09/2023

## SITING CRITERIA DEMONSTRATION

SITING CRITERIA (19.15.34.11 NMAC)  
DEEP RIVER RESOURCES LLC LONE RANGER RF & CONTAINMENTS

## Distance to Groundwater

Plate 1, Plate 2, and the discussion below demonstrates that groundwater (fresh water as defined by NMOCD Rules) at the locations is greater than 100 feet beneath the area of interest that will include the Deep River Resources Lone Ranger RF & Containments.

Plate 1 is a geologic/ topographic map that shows:

1. The area in which the Lone Ranger RF & Containments will be placed identified by the blue stippled polygon.
2. Water wells from the OSE database as a blue triangle inside a colored circle. OSE wells are often mislocated in the WATERS database as older wells are plotted in the center of the quarter, quarter, quarter, of the Section Township and Range. Additionally, the OSE database can include locations of proposed wells (i.e., permit applications). The permit data generally show “no date” and “DTW=0” as data. Plate 1 has screened the OSE data and eliminated permit information from Plate 1. We provide no depth to water data for the OSE wells as these data do not represent static water levels and are often misleading.
3. Water wells from the USGS database as large triangles color-coded to the formation from which the well draws water. Depth to water and the date of measurement are presented in the Plate.
4. Water wells, which are not documented in the public databases but were identified by field inspection or other published reports as colored squares (Misc. well database). Several wells from the Misc. database are shown within the area of Plate 1.

Plate 2a is an area topographic and geologic map that shows:

1. The recycling containment areas identified by the blue stippled polygon with the surface elevation noted in the lower left corner.
2. Water wells measured by the USGS, the year of the measurement and the calculated elevation of the groundwater surface.
3. Water wells measured by professionals and documented in published reports or by staff of Hicks Consultants (Misc.).

Plate 2b is a larger scale map than Plate 2a that shows all the well data used to generate the potentiometric surface presented in Plate 2a.

## Hydrogeology

As shown in Plate 2b, the Triassic Upper Chinle Formation (T(r)cu) crops out in the western area of the map and the Tertiary Ogallala Formation crops out in the southwestern corner. The surface geology at the containment sites is Quaternary eolian and piedmont deposits (Qe/Qp).

Eight driller's logs of varying quality are in the NM OSE database around the Lone Ranger location. These are described briefly below and presented in Appendix Well logs (a location map is also present in the well log appendix). Beginning northwest of the Lone Ranger location and proceeding in a clockwise direction are:

- CP-317 (20S 33E Sec 5) is/was a producing windmill showing a depth to water in the driller's log of 325 feet. It was more than 3 miles northwest of the Lone Ranger site. The log describes 110 feet of alluvial material and caliche underlain by Chinle clay to 520



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DEEP RIVER RESOURCES LLC LONE RANGER RF & CONTAINMENTS

feet. From 520-625 feet is a “water sand” and “Shale and Sand” that may be the Santa Rosa Sandstone, the base of the Chinle. Perhaps the brown and red sand/shale/clay from 625-680 is the Quartermaster Formation.

- CP-1865 #2 (20S 33E Sec2) is about 3 miles north of the Lone Ranger site. This is a dry monitoring well with a total depth of 105 feet. From 21 feet to total depth the log describes sand and red clay, which is probably the Chinle. Below the depth of 89 feet, a blue clay is reported that is also typical of driller’s descriptions of the Chinle.
- CP-1865 #1 (20S 33E Sec 2) is about a half mile east-northeast of CP-1865 #2. It is also a dry hole to a depth of 105 feet with a described lithology similar to CP-1865 #2.
- CP 748 (20S 33E Sec 1) is about 3.5 miles northeast of the Lone Ranger site. It was a dry hole to a depth of 280 feet. The log shows unsaturated sand to 36 feet that is underlain by Chinle lithology which is dominantly clay at this location.
- CP-750 (20S 34E Sec 7) is more than 3 miles east-northeast of the Lone Ranger site. This dry hole is described with alluvial material to a depth of 65 feet. Beneath the alluvial material to the total depth of 320 feet were shales and sandstones typical of the Chinle.
- CP-1860 (20S 34E Sec 30) is about 3 miles southeast of the Lone Ranger site. The 112-foot deep hollow stem auger boring was dry. We believe the upper 58 feet of the boring is alluvium with Chinle lithology of claystone and thin sandstone units to the total depth.
- CP-1884 (21S 32E Sec 1) is more than 3 miles south-southeast of the Lone Ranger site. It was a dry hole showing alluvium and caliche from surface to the total depth of 55 feet.
- Well CP-1151 is mislocated per the stated location in the well log. The dry hole was completed to a depth of 823 feet. The given latitude and longitude of the April 2013 boring are less than a mile south of the Lone Ranger site. However, a February 2014 aerial photograph shows no evidence of disturbance at this location. Its most likely location is at the reported Section 35, T 22S, R 35E, about 12 miles to the south of the reported latitude and longitude.

The data permit a conclusion that the alluvium and caliche overlying the Chinle Formation in the area around the Lone Ranger site is unsaturated. The water bearing units of the Chinle are deeper and confined (artesian).

### **Groundwater Data**

Plate 2a presents groundwater elevation data closest to the Lone Ranger RF & Containments. Two data points are about 1.5 miles east-northeast of the Lone Ranger site: Misc-121, which was gauged by Hicks Consultants in 2019 and USGS-15528. In our field and aerial image search, we found no evidence of the USGS well being located by latitude/longitude. We are convinced that the Misc-121 is the same well as USGS-15528. Information from the USGS database for USGS-15528 is presented in the Well Log Appendix and shows that for the period of record (1968-1976) four of five depth to water measurements are between 400 and 450 feet below the ground surface (groundwater elevation of 3250-3200). The 1976 USGS measurement is less than 200 feet below the ground surface. Because the Hicks Consultants measurement is 30-feet higher than the older USGS data, we contend the 2019 measurement is correct and the 1976 USGS measurement is erroneous.

In our field survey of 2022, we could not locate USGS-15121 (about 1.4 miles north of the site). However, historic aerial imagery on Google Earth contains evidence that a well in this area is

SITING CRITERIA (19.15.34.11 NMAC)  
DEEP RIVER RESOURCES LLC LONE RANGER RF & CONTAINMENTS

probable. The groundwater elevation is consistent with the 2019 measurement of Misc-121, and we believe the sole reading at this location is valid.

USGS-15411 lies about 2 miles northwest of the Lone Ranger RF & Containments and is a shallow well in saturated alluvium. Saturated alluvium within one mile of Laguna Gatuña is not surprising. Groundwater perched on the clay of the Chinle within closed basins and playas is common. We did not use the data from this well (which is also Misc-120) in the development of the potentiometric surface contours of Plate 2a.

Also shown in Plate 2b are groundwater elevation contours (generated by Hicks Consultants) and locations of USGS well data that provided much of the elevation data for the map.

Plate 2c is reproduced from Plate 1 of *Geology and ground-water conditions in southern Lea County, New Mexico*<sup>1</sup> and shows that the elevation of the top of the Chinle (red beds) is about 3575 feet ASL. Given that the elevation of the ground surface at the Lone Ranger site is about 3605, the thickness of alluvium present on top of the Chinle is about (3605-3575=) 30 feet.

We relied upon the most recent data measured by the USGS, published data, and measurements by Hicks Consultants to create Plates 2a and 2b. Water level data from the OSE database rely upon observed water levels by drillers during the completion of the water well. The OSE dataset provides some useful data in certain areas but were not used to generate groundwater elevations for these Plates. Based upon our field surveys and examination of Google Earth images, we are confident that the wells shown on Plate 2a and 2b are close to the plotted points.

Plates 2a and 2b honor all data that we know are accurate to the best of our knowledge. We employed the most recent data available, and we conclude:

- Localized, thin, unconfined groundwater zones exist in some closed depressions of the area, such as Laguna Gatuña. The lateral extent of these groundwater zones that are perched upon underlying Chinle Formation clay units is limited to the area of the depression.
- The uppermost groundwater zone beneath the containment resides in thin sandstones of the Chinle formation or in the Chinle's basal unit, the Santa Rosa Sandstone
- Alluvium overlying the Chinle around the Lone Ranger site is dry, as is the upper 100+ feet of the Chinle.
- Saturated units within the Chinle beneath the Lone Ranger RF & Containments are confined.
- The elevation of confined groundwater beneath the Lone Ranger RF site is 3300-3400 feet ASL.
- A conservative depth to groundwater beneath the Lone Ranger RF is (3605-3400=) 205 feet.

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<sup>1</sup> [https://geoinfo.nmt.edu/publications/water/gw/6/plates/GW6\\_Plate1.pdf](https://geoinfo.nmt.edu/publications/water/gw/6/plates/GW6_Plate1.pdf)

SITING CRITERIA (19.15.34.11 NMAC)  
DEEP RIVER RESOURCES LLC LONE RANGER RF & CONTAINMENTS

### **Distance to Municipal Boundaries and Fresh Water Fields**

Plate 3 demonstrates that the Lone Ranger RF & Containments are not within incorporated municipal boundaries or within defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.

- The closest municipality is Monument, approximately 20 miles northeast.
- The closest mapped public wells belong to the Monument Water Users Coop. These municipal supply wells are about 21 miles to the northeast.

### **Distance to Subsurface Mines**

Plate 4 and our general reconnaissance of the Lone Ranger RF & Containments demonstrate that the nearest mines are caliche pits. The site is not within an area overlying a subsurface mine.

- A caliche pit is less than 1 mile east-northeast (see Plate 8)
- The closest subsurface mine is slightly more than 5 miles to the southwest.

### **Distance to High or Critical Karst Areas**

Plate 5 shows the Lone Ranger RF & Containments are not within mapped zones of high or critical Karst with respect to BLM mapped areas.

- The proposed containments are located within a “low” potential karst area.
- The nearest “high” or “critical” potential karst area is located approximately 10 miles southwest of the proposed containments.
- We observed no evidence of solution voids or unstable ground near the site during the field inspection.

### **Distance to 100-Year Floodplain**

Plate 6 demonstrates that the Lone Ranger site is within Zone D as designated by the Federal Emergency Management Agency with respect to the Flood Insurance Rate 100-Year Floodplain.

- FEMA describes the location as an area with possible but undetermined flood hazards. No flood hazard analysis has been conducted.
- Our field inspection and examination of the topography permits a conclusion that the location is not within any floodplain and has low risk for flooding.
- The nearest mapped flood hazard is about 15 miles west and is associated with an intermittent lake.

### **Distance to Surface Water**

Plate 7 shows the closest surface water body, a Lake/Pond, plots about 1 mile south of the Lone Ranger RF & Containments.

- This mapped lake and another in the southeast corner of the Plate are constructed stock ponds.
- The site visit and photographs demonstrate that the recycling project area is not within 300 feet of a continuously flowing watercourse or 200-feet of any other significant watercourse, lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark) or spring.

SITING CRITERIA (19.15.34.11 NMAC)  
DEEP RIVER RESOURCES LLC LONE RANGER RF & CONTAINMENTS

### **Distance to Permanent Residence or Structures**

Plate 8 and the site visit demonstrates that the location is not within 1000 feet from an occupied permanent residence, school, hospital, institution, church, or other structure in existence at the time of initial application.

- The nearest structures are the fresh water frac pond, a well pad and lease roads.
- No residences or other structures are in the area.

### **Distance to Non-Public Water Supply**

Plates 1 and 7 demonstrate that the Lone Ranger site is not within 500 horizontal feet of a spring or fresh water well used for domestic or stock watering purposes, in existence at the time of initial application.

- Plate 1 shows the locations of all area water wells, active or plugged.
- There are no domestic water wells located within 1,000 feet of the area of interest.
- No springs were identified within the mapping area (see Plate 7)

### **Distance to Wetlands**


Plate 9 demonstrates the Lone Ranger RF & Containments are not within 500 feet of mapped wetlands using the New Mexico database.

- The nearest designated wetland is mapped in a surface depression on top of Hat Mesa more than 5 miles to the southeast. Interestingly, this depression is not mapped as a Lake/Pond on the USGS 7.5-minute quadrangle map as a pond. Hicks Consultants has visited this depression on numerous occasions as it is adjacent to several windmills and a stock tank.



## SITING CRITERIA DEMONSTRATION PLATES

P:\CascadeDeepRiverResources\CascadeDRResourcesLoneRanger.aprx

polygon_spe	
	Recycling Containment Area
USGS Gauging Station (GW Elev, Date)	
Aquifer Code, Well Status	
	Alluvium/Bolsom
	Santa Rosa
Misc. Water Wells (GW Elev, Date)	
Well Depth (ft)	
	No Data
	> 500
NM_Geology	
Map Unit, Description	
	Qe/Qp, Quaternary-Eolian Piedmont Deposits
	Qoa, Quaternary-Older Alluvial Deposits, Qoa, Quaternary-Older Alluvial Deposits
	Qp, Quaternary-Piedmont Alluvial Deposits, Qp, Quaternary-Piedmont Alluvial Deposits
	T(r)cu, Triassic-Upper Chinle Group, T(r)cu, Triassic-Upper Chinle Group

R.T. Hicks Consultants, Ltd  
 901 Rio Grande Blvd NW Suite F-142  
 Albuquerque, NM 87104  
 Ph: 505.266.5004

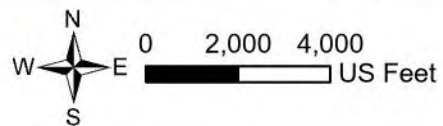
Plates 1 &amp; 2 Legend

Lone Ranger RF &amp; Conts. Deep River Resources LLC June 2023

The map displays a topographic view of a region with various wells and pipelines. Key features include:

- Lone Ranger RF:** A blue-shaded rectangular area in the center of the map.
- Wells and Pipelines:** Numerous wells (e.g., USGS-15121, USGS-15411, MISC-120, MISC-121, USGS-15528) and pipelines are marked with their respective depths and dates.
- Geographical Features:** Laguna Salada is visible on the left side, and the Lone Ranger area is highlighted in blue.
- Grid and Contours:** The map includes a grid with numbers (13-36) and contour lines indicating elevation.

Well ID	Depth (ft)	Date
USGS-15121	335.1	4/20/1955
USGS-15411	33.17	2/2/1996
MISC-120	3499.2	2/3/1971
MISC-121	3330	No Date
USGS-15528	173.99	4/15/1976



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Albuquerque, NM 87104  
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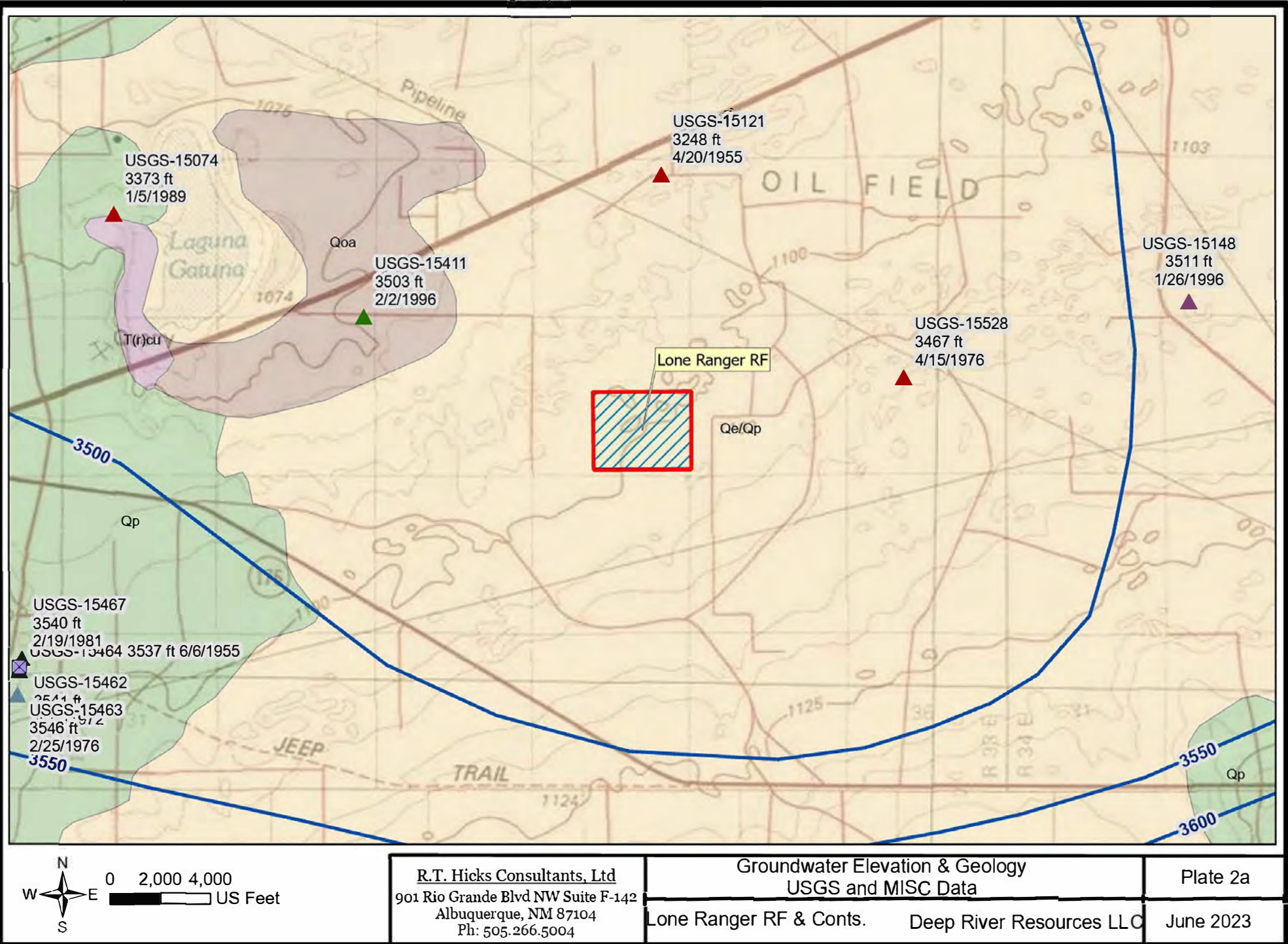
Plate 1

Deep River Resources LLC

June 2023



P:\CascadeDeepRiverResources\CascadeDRResourcesLoneRanger.aprx



**R.T. Hicks Consultants, Ltd**  
 901 Rio Grande Blvd NW Suite F-142  
 Albuquerque, NM 87104  
 Ph: 505.266.5004

**Groundwater Elevation & Geology**  
**USGS and MISC Data**

**Plate 2a**

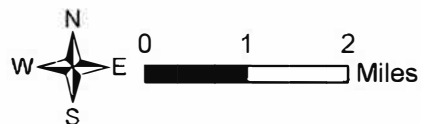
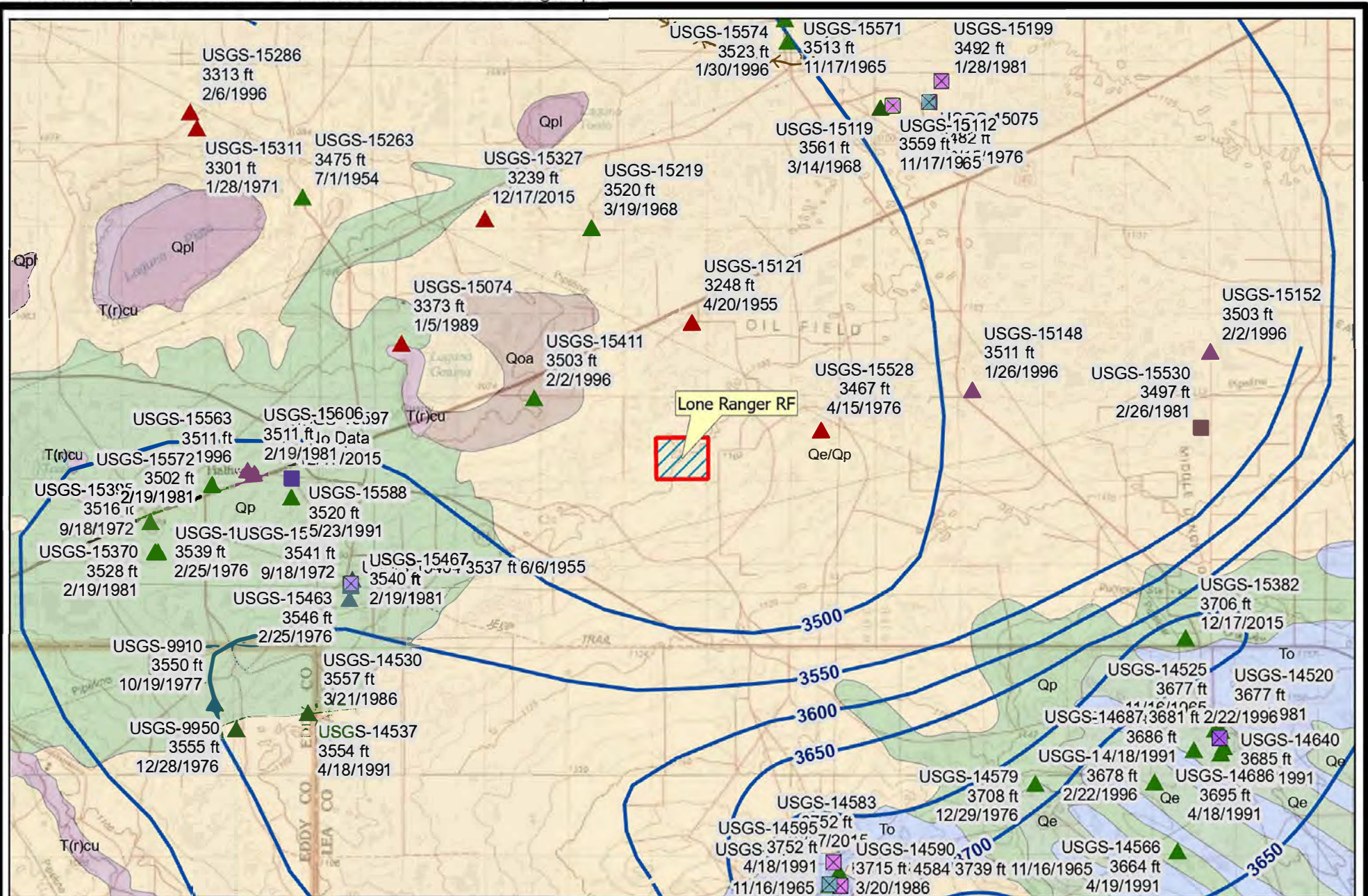
**Lone Ranger RF & Conts.**

**Deep River Resources LLC**

**June 2023**



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**R.T. Hicks Consultants, Ltd**  
901 Rio Grande Blvd NW Suite F-142  
Albuquerque, NM 87104  
Ph: 505.266.5004

## Groundwater Elevation & Geology USGS and MISC Data

## Lone Ranger RF & Conts.

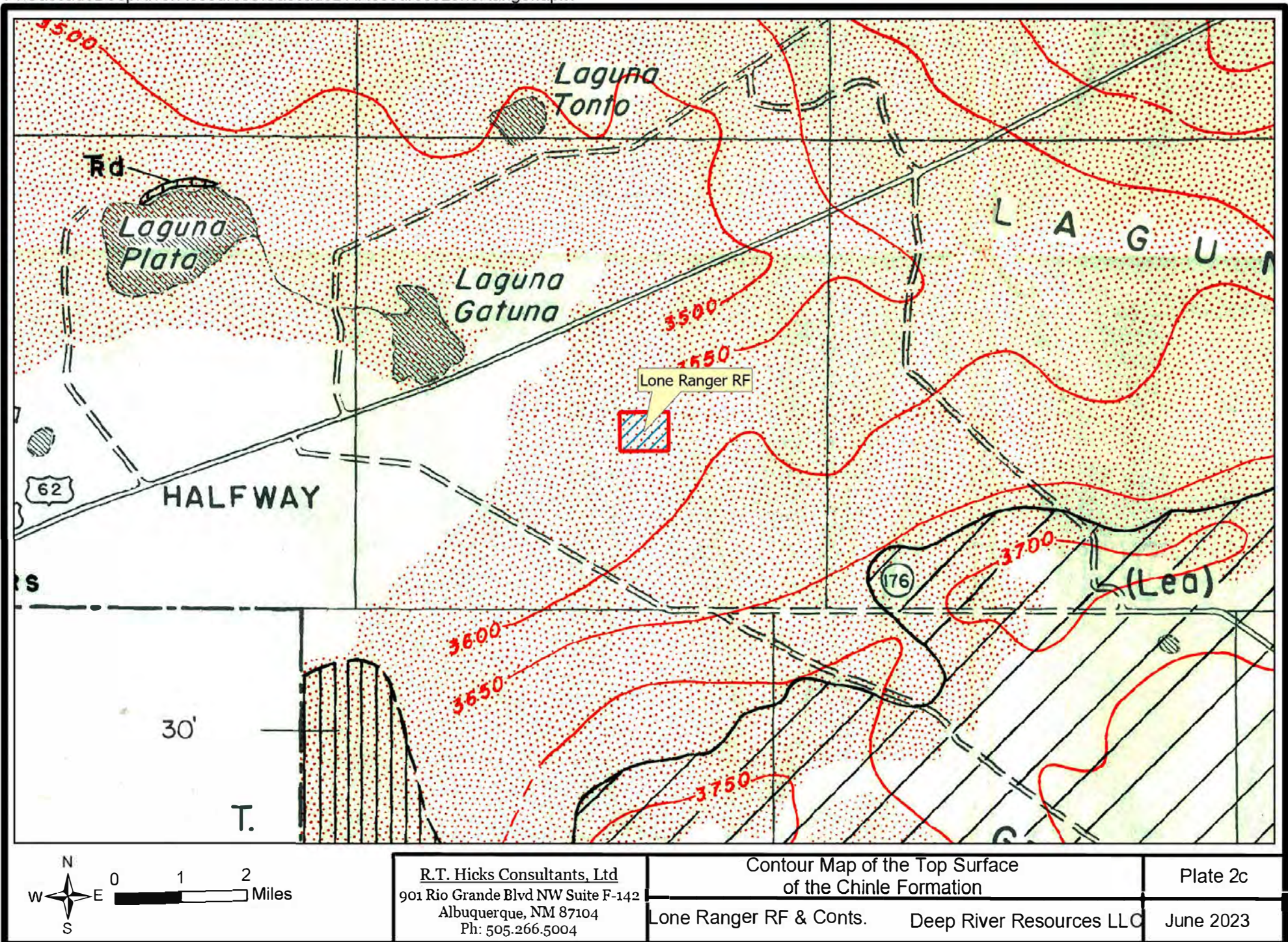
Deep River Resources LLC

Plate 2b

June 2023



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**Municipal Supply Wells (OSE)**

**Well Depth (ft)**

- <=150
- 151-350

**polygon\_spe**

- Recycling Containment Area
- municipal\_boundaries

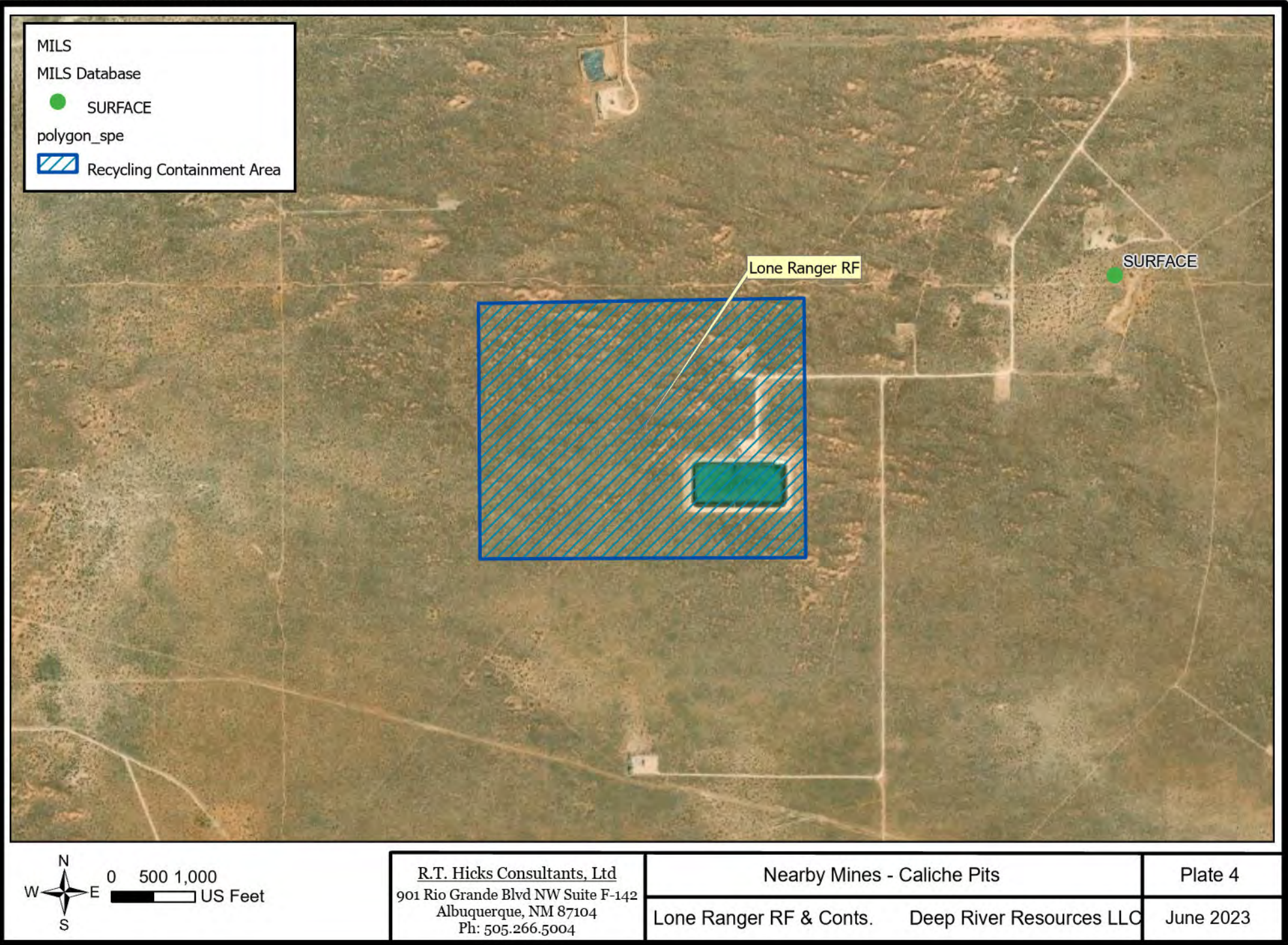
**Map Labels:** Lovington Hwy, Hobbs Hwy, Highway 62-180, Pecos River, Salt Lake, Eddy Lea, Deep River Resources LLC-Lone Ranger RF &Containments, L-02770, L-05486, L-03042, L-00114, L-01784, L-03035, L-00220, L-04920, L-04920, L-04920, L-04921, L-00220, L-03248, L-03248, L-03248, L-05611, L-05314, L-00438, L-00438.

**Scale:** 0 5 10 Miles

<b>R.T. Hicks Consultants, Ltd</b> 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearest Municipalities & Public Water Supplies	Plate 3
	Lone Ranger RF & Conts.    Deep River Resources LLC	June 2023

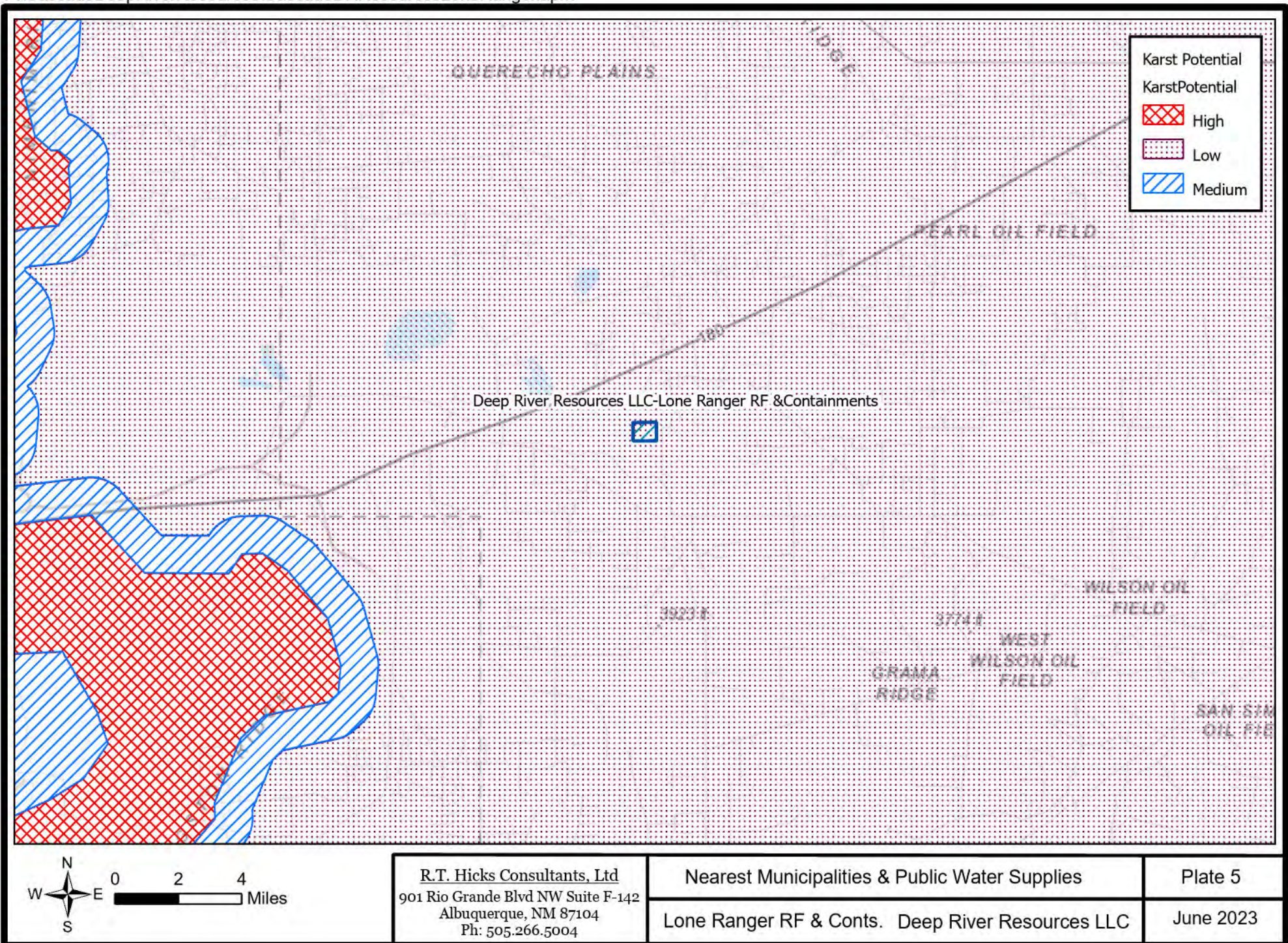


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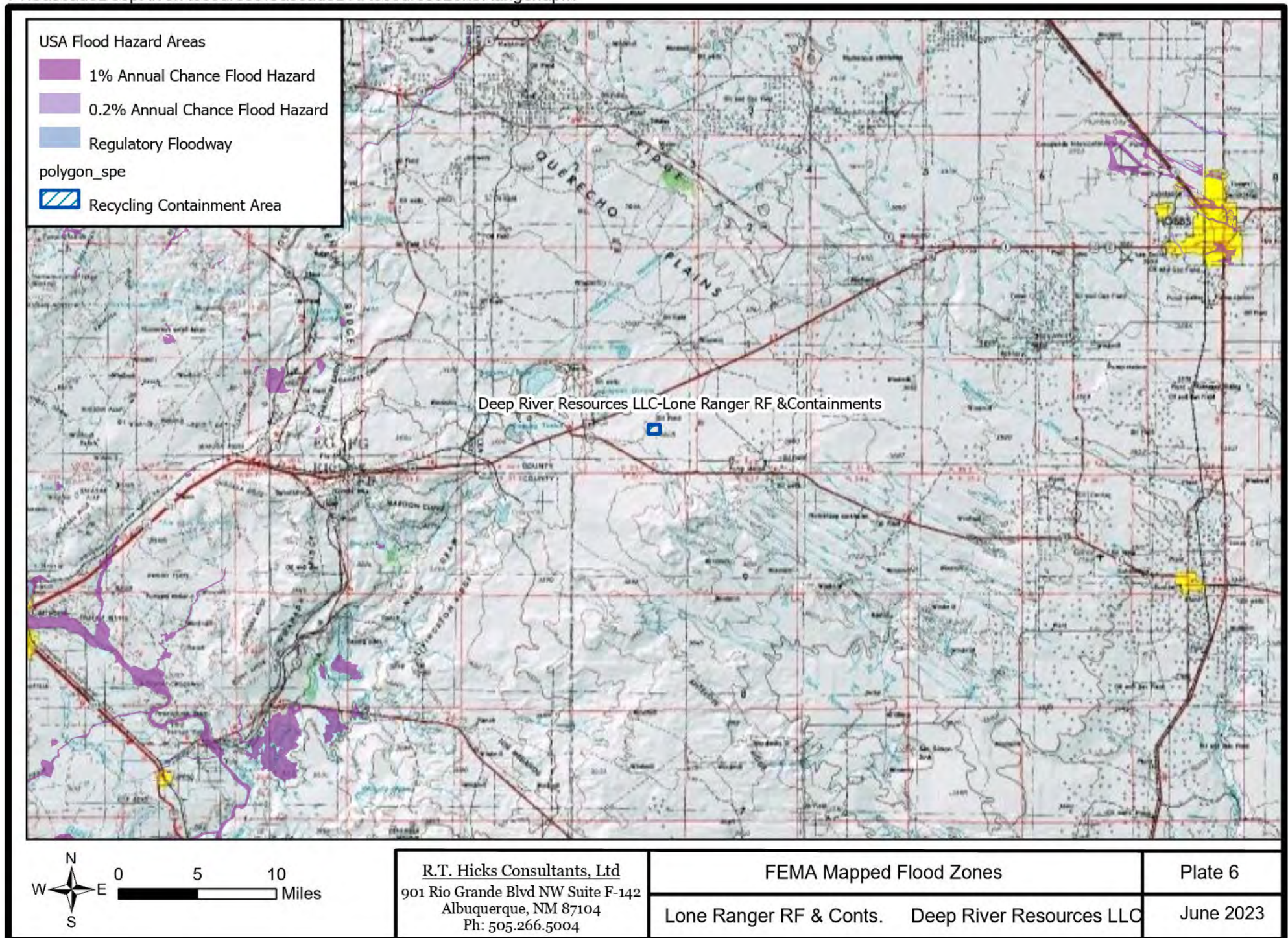


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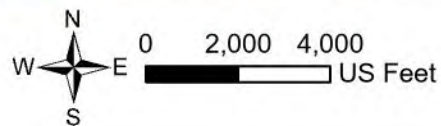
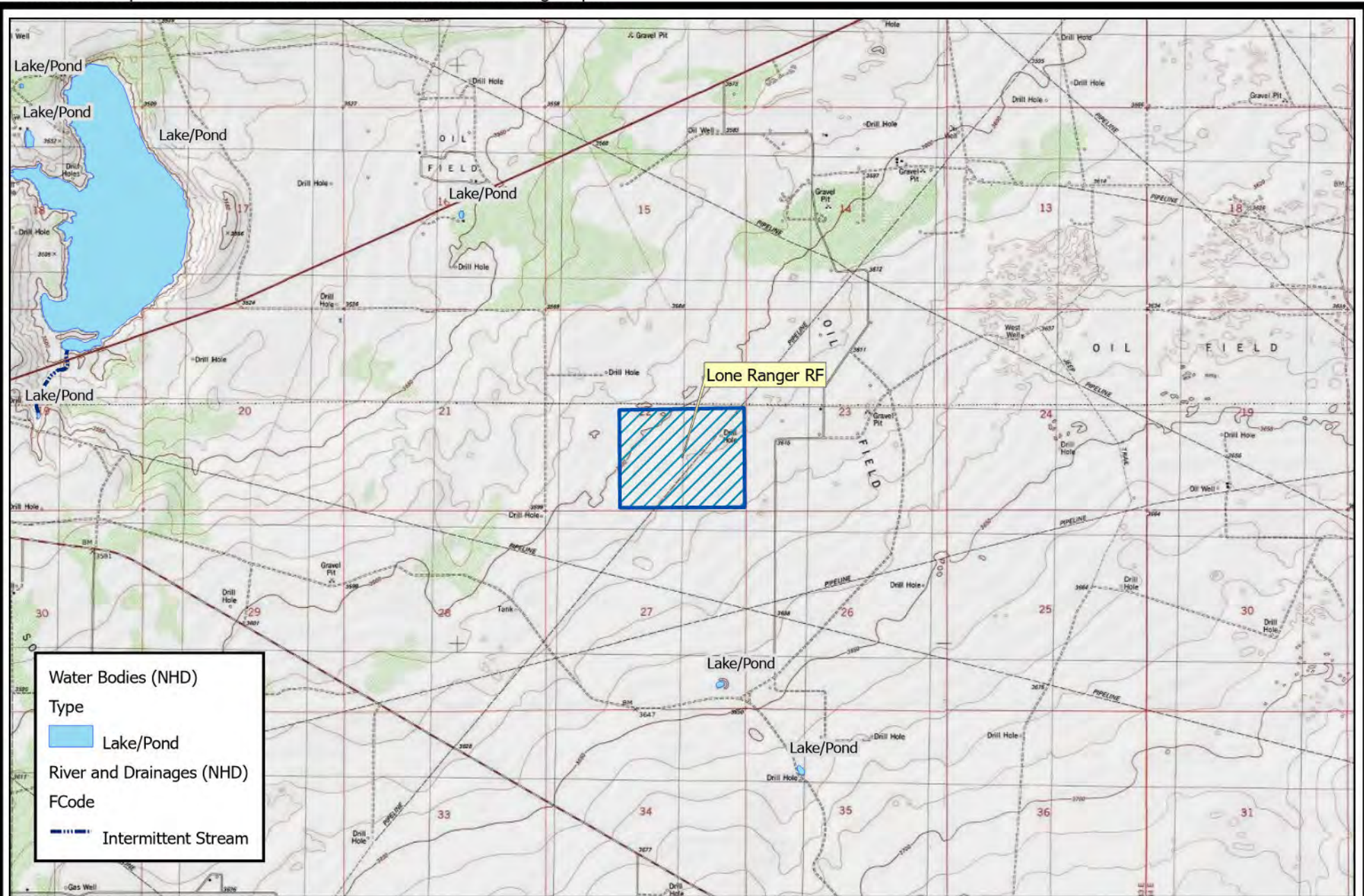


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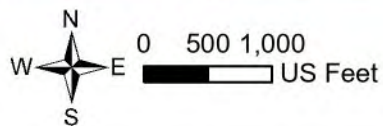
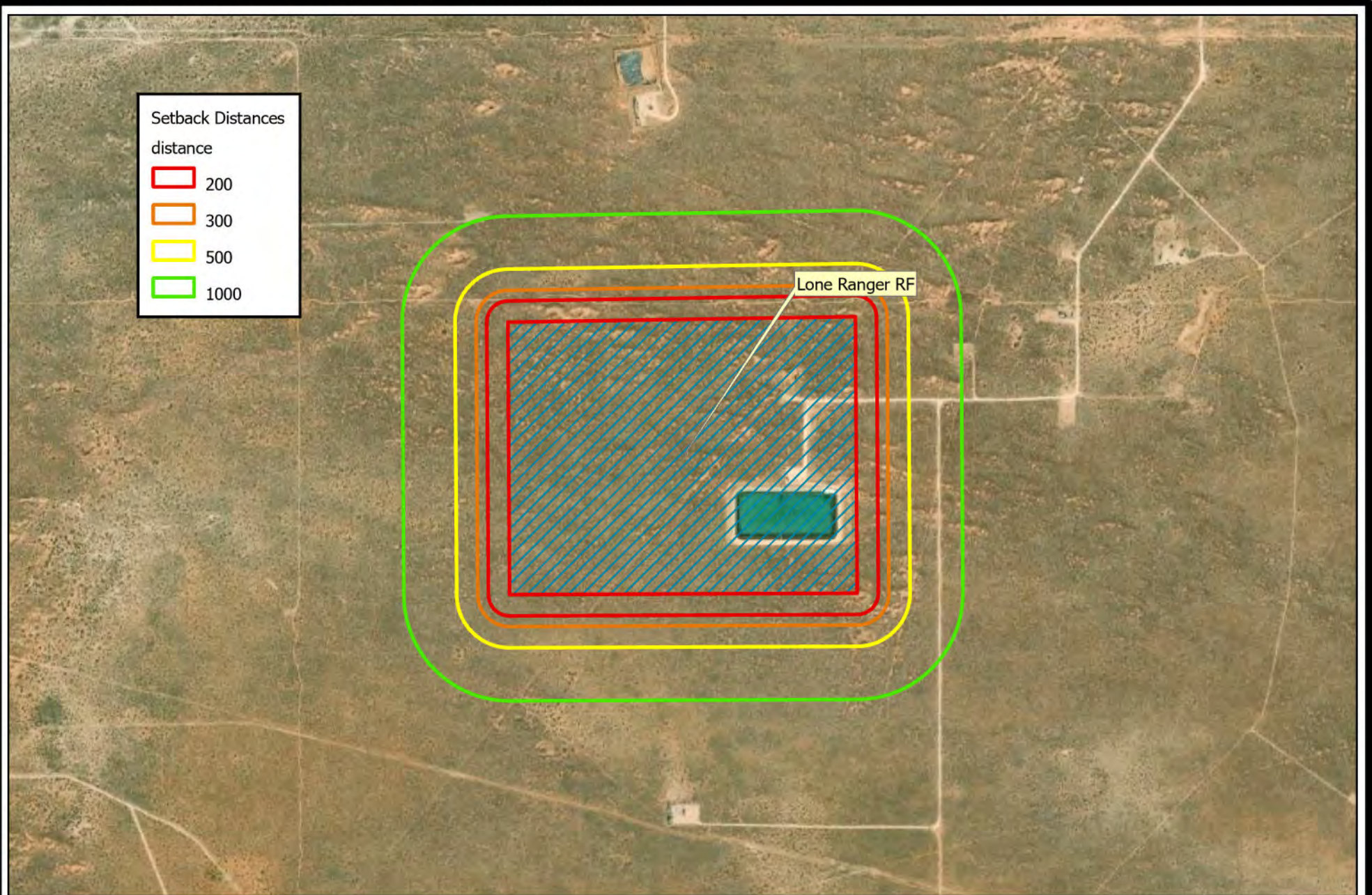
R.T. Hicks Consultants, Ltd  
 901 Rio Grande Blvd NW Suite F-142  
 Albuquerque, NM 87104  
 Ph: 505.266.5004

Mapped Surface Water  
 Lone Ranger RF & Conts. Deep River Resources LLC

Plate 7  
 June 2023



P:\CascadeDeepRiverResources\CascadeDRResourcesLoneRanger.aprx



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearest Structures	Plate 8
	Lone Ranger RF & Conts.    Deep River Resources LLC	June 2023



nmWetlandsWGS84

Wetland Desc.

- Freshwater Emergent Wetland
- Freshwater Pond
- Lake

polygon\_spe

- Recycling Containment Area



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901 Rio Grande Blvd NW Suite F-142  
Albuquerque, NM 87104  
Ph: 505.266.5004

Mapped NM Wetlands	
Lone Ranger RF & Conts.	Deep River Resources LLC

Plate 9

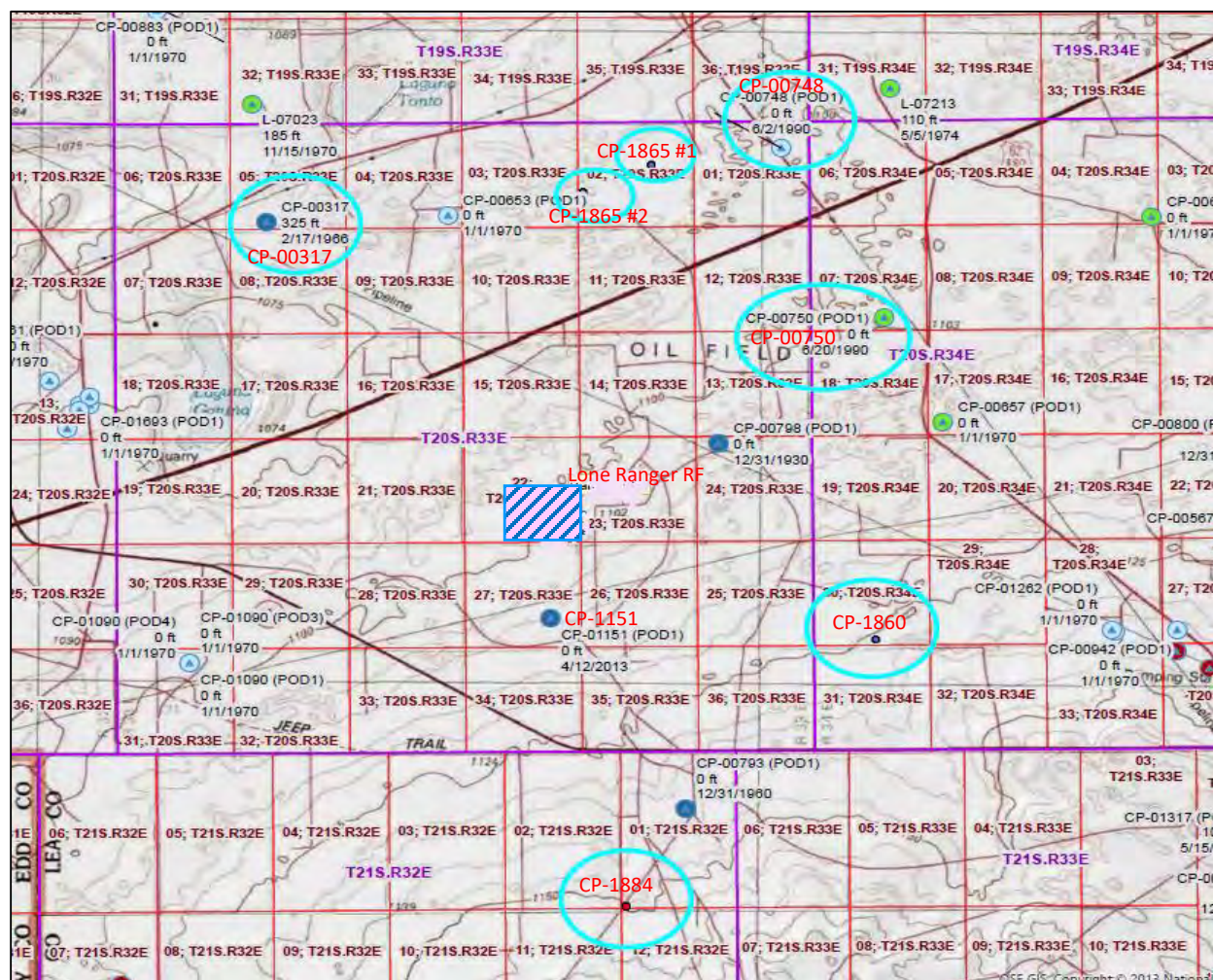
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June 2023

## APPENDIX WELL LOGS & USGS DATA



## Locations of NM OSE Well Logs near the Lone Ranger RF &amp; Containments



SANTA FE

Form WR-23

STATE ENGINEER OFFICE

Little Eddy Unit WW #1  
Fed. Lease LC-069944

# WELL RECORD

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the nearest district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1A and Section 5 need be completed.

## Section 1


(A) Owner of well Pan American Petroleum Corporation  
 Street and Number Box 68 - Hobbs, New Mexico  
 City Hobbs State New Mexico  
 Well was drilled under Permit No. CP-317 and is located in the  
SW 1/4 SE 1/4 SW 1/4 of Section 5 Twp. 20S Rge. 33E  
 (B) Drilling Contractor \_\_\_\_\_ License No. \_\_\_\_\_  
 Street and Number \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_  
 Drilling was commenced \_\_\_\_\_ 19\_\_\_\_  
 Drilling was completed \_\_\_\_\_ 19\_\_\_\_

(Plat of 640 acres)

Elevation at top of casing in feet above sea level \_\_\_\_\_ Total depth of well \_\_\_\_\_  
 State whether well is shallow or artesian \_\_\_\_\_ Depth to water upon completion \_\_\_\_\_

## Section 2 PRINCIPAL WATER-BEARING STRATA

No.	Depth in Feet		Thickness in Feet	Description of Water-Bearing Formation
	From	To		
1				
2				
3				
4				
5				

## Section 3 RECORD OF CASING

Dia in.	Pounds ft.	Threads in	Depth		Feet	Type Shoe	Perforations	
			Top	Bottom			From	To

## Section 4 RECORD OF MUDDING AND CEMENTING

Depth in Feet		Diameter Hole in in.	Tons Clay	No. Sacks of Cement	Methods Used
From	To				

## Section 5 PLUGGING RECORD

Name of Plugging Contractor Pan American Petroleum Corporation License No. \_\_\_\_\_  
 Street and Number Box 68 City Hobbs State New Mexico  
 Tons of Clay used \_\_\_\_\_ Tons of Roughage used \_\_\_\_\_ Type of roughage \_\_\_\_\_  
 Plugging method used Welded steel cap Date Plugged April 20, 19 67  
 Plugging approved by: \_\_\_\_\_ Cement Plugs were placed as follows:

*James D. Wright*  
 Basin Supervisor

FOR USE OF STATE ENGINEER ONLY  
 STATE ENGINEER OFFICE  
 Date Received APR 27 AM 8:10 1967  
 State Engr. \_\_\_\_\_  
 File \_\_\_\_\_  
 File No. CP-317 Use D.W.D. Location No. 20.335.343

No.	Depth of Plug		No. of Sacks Used
	From	To	



## LOG OF WELL.

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described well.

Released to Imaging: 11/30/2023 11:44:26 AM

Form WR-23

STATE ENGINEER OFFICE

SANTA FE

## WELL RECORD

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the nearest district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1A and Section 5 need be completed.

## Section 1


(A) Owner of well Pan American Pet. Corp.Street and Number Box 68City Hobbs State N. M.Well was drilled under Permit No. CP-317 and is located in the  
SW 1/4 SE 1/4 SW 1/4 of Section 5 Twp. 20 Rge. 33(B) Drilling Contractor Abbott Bros. License No. WD-46Street and Number Box 637City Hobbs State N. M.Drilling was commenced Feb. 5 1966Drilling was completed Feb. 17 1966

(Plat of 640 acres)

Elevation at top of casing in feet above sea level \_\_\_\_\_ Total depth of well 680'State whether well is shallow or artesian shallow Depth to water upon completion 325'

## Section 2

## PRINCIPAL WATER-BEARING STRATA

No.	Depth in Feet		Thickness in Feet	Description of Water-Bearing Formation
	From	To		
1	520	540	20	Brown Water Sand
2	625	645	20	Brown Water Sand
3	660	675	15	Brown Water Sand
4				
5				

## Section 3

## RECORD OF CASING

Dia in.	Pounds ft.	Threads in	Depth		Feet	Type Shoe	Perforations	
			Top	Bottom			From	To
7"	23	10	0	575	575	none	515	575

## Section 4

## RECORD OF MUDDING AND CEMENTING

Depth in Feet		Diameter Hole in in.	Tons Clay	No. Sacks of Cement	Methods Used
From	To				

## Section 5

## PLUGGING RECORD

Name of Plugging Contractor \_\_\_\_\_ License No. \_\_\_\_\_

Street and Number \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

Tons of Clay used \_\_\_\_\_ Tons of Roughage used \_\_\_\_\_ Type of roughage \_\_\_\_\_

Plugging method used \_\_\_\_\_ Date Plugged \_\_\_\_\_ 19 \_\_\_\_\_

Plugging approved by: \_\_\_\_\_

Cement Plugs were placed as follows:

No.	Depth of Plug		No. of Sacks Used
	From	To	

Basin Supervisor \_\_\_\_\_

FOR USE OF STATE ENGINEER ONLY

Date Received \_\_\_\_\_

File No. CP-317Use owdLocation No. 20.33.5.343

## LOG OF WELL

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described well.

Released to Imaging: 11/30/2023 11:44:26 AM



# WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

[www.ose.state.nm.us](http://www.ose.state.nm.us)

OSE DIT JUL 22 2021 PM 2:05

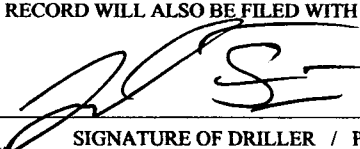
1. GENERAL AND WELL LOCATION	OSE POD NO. (WELL NO.) POD1 CP-1865		WELL TAG ID NO.		OSE FILE NO(S). CP-01865			
	WELL OWNER NAME(S) BTA OIL PRODUCERS, LLC				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS 104 S PECOS ST				CITY MIDLAND			
					STATE TX			
					ZIP 79701			
WELL LOCATION (FROM GPS)	DEGREES LATITUDE		MINUTES 32	SECONDS 36	12.5	N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND * DATUM REQUIRED: WGS 84	
	LONGITUDE		-103	37	54	W		
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE LEA SECTION 2 TOWNSHIP 20S RANGE 33E								
2. DRILLING & CASING INFORMATION	LICENSE NO. WD-1753		NAME OF LICENSED DRILLER JACOB FRIESSEN			NAME OF WELL DRILLING COMPANY VANGUARD		
	DRILLING STARTED 2-8-21		DRILLING ENDED 2-8-21		DEPTH OF COMPLETED WELL (FT) 105	BORE HOLE DEPTH (FT) 105	DEPTH WATER FIRST ENCOUNTERED (FT) 0	
	COMPLETED WELL IS: <input type="checkbox"/> ARTESIAN <input checked="" type="checkbox"/> DRY HOLE <input type="checkbox"/> SHALLOW (UNCONFINED)					STATIC WATER LEVEL IN COMPLETED WELL (FT) 0		
	DRILLING FLUID: <input checked="" type="checkbox"/> AIR <input type="checkbox"/> MUD ADDITIVES - SPECIFY:							
	DRILLING METHOD: <input checked="" type="checkbox"/> ROTARY <input type="checkbox"/> HAMMER <input type="checkbox"/> CABLE TOOL <input type="checkbox"/> OTHER - SPECIFY:							
	DEPTH (feet bgl)		BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
	FROM	TO						
	-1	99	4.5	BLANK PVC	THREAD 2.375	2	.187	
	99	105	4.5	SCREEN PVC	THREAD 2.375	2	.187	.02
3. ANNULAR MATERIAL	DEPTH (feet bgl)		BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT		
	FROM	TO						
	0	99	4.5	GROUT	8	POURED		
	99	105	4.5	SILICA SAND	.5	POURED		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 04/30/19)

FILE NO. C-1865	POD NO. 1	TRN NO. 686912
LOCATION 20S-33E-02	2-3-4	WELL TAG ID NO. NA
		PAGE 1 OF 2



4. HYDROGEOLOGIC LOG OF WELL	DEPTH (feet bgl)		THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER- BEARING ZONES (gpm)
	FROM	TO				
	0	1	1	TOPSOIL	Y ✓ N	
	1	21	20	SAND	Y ✓ N	
	21	81	61	SANDY RED CLAY	Y ✓ N	
	81	105	24	BLUE CLAY	Y ✓ N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:					TOTAL ESTIMATED WELL YIELD (gpm): 0.00	
<input type="checkbox"/> PUMP <input type="checkbox"/> AIR LIFT <input checked="" type="checkbox"/> BAILER <input type="checkbox"/> OTHER - SPECIFY:						
5. TEST; RIG SUPERVISION	WELL TEST    TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.					
	MISCELLANEOUS INFORMATION:					
	PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE: PETE LOEWEN					
6. SIGNATURE	BY SIGNING BELOW, I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED WELL. I ALSO CERTIFY THAT THE WELL TAG, IF REQUIRED, HAS BEEN INSTALLED AND THAT THIS WELL RECORD WILL ALSO BE FILED WITH THE PERMIT HOLDER WITHIN 30 DAYS AFTER THE COMPLETION OF WELL DRILLING.					
	 JACOB FRIESSEN SIGNATURE OF DRILLER / PRINT SIGNEE NAME				7-13-21 DATE	

FOR OSE INTERNAL USE

WR-20 WELL RECORD &amp; LOG (Version 04/30/2019)

FILE NO. C-1865	POD NO. 1	TRN NO. 686912
LOCATION 205-33E-02	2-3-4	WELL TAG ID NO. NA

PAGE 2 OF 2



# WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

[www.ose.state.nm.us](http://www.ose.state.nm.us)

OSE DTI JUL 22 2021 PM 2:05

1. GENERAL AND WELL LOCATION	OSE POD NO. (WELL NO.) POD2 CP-1865		WELL TAG ID NO.		OSE FILE NO(S). CP-01865			
	WELL OWNER NAME(S) BTA OIL PRODUCERS, LLC				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS 104 S PECOS ST				CITY MIDLAND	STATE TX	ZIP 79701	
	WELL LOCATION (FROM GPS)	DEGREES LATITUDE 32	MINUTES 35	SECONDS 59 N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND			
		LONGITUDE -103	38	30.4 W	* DATUM REQUIRED: WGS 84			
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE LEA SECTION 2 TOWNSHIP 20S RANGE 33E								
2. DRILLING & CASING INFORMATION	LICENSE NO. WD-1753		NAME OF LICENSED DRILLER JACOB FRIESSEN			NAME OF WELL DRILLING COMPANY VANGURD		
	DRILLING STARTED 2-8-21	DRILLING ENDED 2-8-21	DEPTH OF COMPLETED WELL (FT) 105	BORE HOLE DEPTH (FT) 105	DEPTH WATER FIRST ENCOUNTERED (FT) 0			
	COMPLETED WELL IS: <input type="checkbox"/> ARTESIAN <input checked="" type="checkbox"/> DRY HOLE <input type="checkbox"/> SHALLOW (UNCONFINED)				STATIC WATER LEVEL IN COMPLETED WELL (FT) 0			
	DRILLING FLUID: <input checked="" type="checkbox"/> AIR <input type="checkbox"/> MUD ADDITIVES - SPECIFY:							
	DRILLING METHOD: <input checked="" type="checkbox"/> ROTARY <input type="checkbox"/> HAMMER <input type="checkbox"/> CABLE TOOL <input type="checkbox"/> OTHER - SPECIFY:							
	DEPTH (feet bgl)		BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
	FROM	TO						
	-1	99	4.5	BLANK PVC	THREAD 2.375	2	.187	
	99	105	4.5	SCREEN PVC	THREAD 2.375	2	.187	.02
3. ANNULAR MATERIAL	DEPTH (feet bgl)		BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT		
	FROM	TO						
	0	99	4.5	GROUT	8	POURED		
	99	105	4.5	SILICA SAND	.5	POURED		

FOR OSE INTERNAL USE

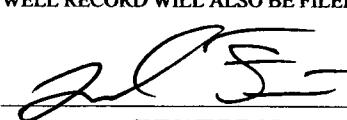
WR-20 WELL RECORD & LOG (Version 04/30/19)

FILE NO. <u>C-1865</u>	POD NO. <u>2</u>	TRN NO. <u>686912</u>
LOCATION <u>20S-33E-02 31-B</u>	WELL TAG ID NO. <u>NA</u>	PAGE 1 OF 2

05E DTI JUL 22 2021 PM2:05

4. HYDROGEOLOGIC LOG OF WELL	DEPTH (feet bgl)		THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER- BEARING ZONES (gpm)
	FROM	TO				
	0	2	2	TOPSOIL	Y    ✓ N	
	2	21	19	CALICHE	Y    ✓ N	
	21	48	27	SAND	Y    ✓ N	
	48	66	18	RED CLAY	Y    ✓ N	
	66	77	11	SAND	Y    ✓ N	
	77	89	12	RED CLAY	Y    ✓ N	
	89	105	16	BLUE CLAY	Y    ✓ N	
					Y    N	
					Y    N	
					Y    N	
					Y    N	
					Y    N	
					Y    N	
					Y    N	
					Y    N	
					Y    N	
					Y    N	
					Y    N	
					Y    N	
					Y    N	
					Y    N	
					Y    N	
					Y    N	
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: <input type="checkbox"/> PUMP <input type="checkbox"/> AIR LIFT <input checked="" type="checkbox"/> BAILER <input type="checkbox"/> OTHER - SPECIFY:					TOTAL ESTIMATED WELL YIELD (gpm):            0.00	

5. TEST; RIG SUPERVISION	WELL TEST		TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.
MISCELLANEOUS INFORMATION:			
PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:			
PETE LOEWEN			

6. SIGNATURE	BY SIGNING BELOW, I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED WELL. I ALSO CERTIFY THAT THE WELL TAG, IF REQUIRED, HAS BEEN INSTALLED AND THAT THIS WELL RECORD WILL ALSO BE FILED WITH THE PERMIT HOLDER WITHIN 30 DAYS AFTER THE COMPLETION OF WELL DRILLING.	
 SIGNATURE OF DRILLER / PRINT SIGNED NAME	JACOB FRIESSEN	7-13-21
		DATE

FOR OSE INTERNAL USE		WR-20 WELL RECORD & LOG (Version 04/30/2019)	
FILE NO. C-1865	POD NO. 2	TRN NO. 686912	
LOCATION 205-33E-02 3-1-3	WELL TAG ID NO. NA	PAGE 2 OF 2	

Revised June 1972

STATE ENGINEER OFFICE  
WELL RECORD

475940

## Section 1. GENERAL INFORMATION

(A) Owner of well Grace Drilling Co. Owner's Well No. \_\_\_\_\_  
Street or Post Office Address P.O. Box 13480  
City and State Odessa, TX 79768 '91 JUN 5 AM 10 47

Well was drilled under Permit No. CP 748 and is located in the STATE ENGINEER OFFICE  
SANTA FE NEW MEXICO  
a. NE  $\frac{1}{4}$   $\frac{1}{4}$   $\frac{1}{4}$   $\frac{1}{4}$  of Section 1 Township 20 Range 33E N.M.P.M.  
b. Tract No. \_\_\_\_\_ of Map No. \_\_\_\_\_ of the \_\_\_\_\_  
c. Lot No. \_\_\_\_\_ of Block No. \_\_\_\_\_ of the \_\_\_\_\_  
Subdivision, recorded in \_\_\_\_\_ County.  
d. X= \_\_\_\_\_ feet, Y= \_\_\_\_\_ feet, N.M. Coordinate System \_\_\_\_\_ Zone in  
the \_\_\_\_\_ Grant.

(B) Drilling Contractor West Texas Water Well Service License No. WK 1184  
Address 3432 W. University Odessa, TX 79764  
Drilling Began 6-1-90 Completed 6-2-90 Type tools Air rotary Size of hole 8 3/4 in.  
Elevation of land surface or \_\_\_\_\_ at well is \_\_\_\_\_ ft. Total depth of well \_\_\_\_\_ ft.  
Completed well is ☐ shallow ☐ artesian. Depth to water upon completion of well \_\_\_\_\_ ft.

## Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet		Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
From	To			

## Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet		Length (feet)	Type of Shoe	Perforations	
			Top	Bottom			From	To
NO	CASING							

## Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet		Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
From	To				

## Section 5. PLUGGING RECORD

Plugging Contractor West Texas Water Well Service  
Address \_\_\_\_\_  
Plugging Method Pumped grout - neat cement  
Date Well Plugged 6-2-90  
Plugging approved by: \_\_\_\_\_

State Engineer Representative

No.	Depth in Feet		Cubic Feet of Cement
	Top	Bottom	
1			
2			
3			
4			

## FOR USE OF STATE ENGINEER ONLY

Date Received June 19, 1991

Quad \_\_\_\_\_ FWL \_\_\_\_\_ FSL \_\_\_\_\_

File No. CP-748Use OWDLocation No. 20.33.1.24144



— 44 —

STATE DEPT. OFFICE  
RCSNELL NEW MEXICO  
JUN 19 AM 10:29

No casing was installed

Robert E. Collis  
Driller

Released to Imaging: 11/30/2023 11:44:26 AM

Revised June 1972

STATE ENGINEER OFFICE  
WELL RECORD

475954

## Section 1. GENERAL INFORMATION

(A) Owner of well TXO Prod. Owner's Well No. \_\_\_\_\_  
Street or Post Office Address c/o Glenn's Water Well Service,  
City and State P.O. Box 692 Tatum, N.M. 88267

Well was drilled under Permit No. CP-750 and is located in the:

- a. \_\_\_\_\_  $\frac{1}{4}$  \_\_\_\_\_  $\frac{1}{4}$  SW  $\frac{1}{4}$  SE  $\frac{1}{4}$  of Section 7 Township 20-S. Range 34-E. N.M.P.M.  
b. Tract No. \_\_\_\_\_ of Map No. \_\_\_\_\_ of the \_\_\_\_\_  
c. Lot No. \_\_\_\_\_ of Block No. \_\_\_\_\_ of the \_\_\_\_\_  
Subdivision, recorded in \_\_\_\_\_ County.  
d. X= \_\_\_\_\_ feet, Y= \_\_\_\_\_ feet, N.M. Coordinate System \_\_\_\_\_ Zone in  
the \_\_\_\_\_ Grant.

(B) Drilling Contractor Glenn's Water Well Service, Inc. License No. WD 421

Address P.O. Box 692 Tatum, N.M. 88267Drilling Began 6/20/90 Completed 6/20/90 Type tools rotary Size of hole 7 7/8 in.Elevation of land surface or \_\_\_\_\_ at well is \_\_\_\_\_ ft. Total depth of well 320 ft.Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well \_\_\_\_\_ ft.

## Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet		Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
From	To			
			dry hole	26
				AM 8 29

## Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet		Length (feet)	Type of Shoe	Perforations	
			Top	Bottom			From	To

## Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet		Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
From	To				

## Section 5. PLUGGING RECORD

Plugging Contractor \_\_\_\_\_

Address \_\_\_\_\_

Plugging Method well was plugged with dirt

Date Well Plugged \_\_\_\_\_

Plugging approved by: \_\_\_\_\_

State Engineer Representative

No.	Depth in Feet		Cubic Feet of Cement
	Top	Bottom	
1			
2			
3			
4			

## FOR USE OF STATE ENGINEER ONLY

Date Received July 26, 1990

Quad \_\_\_\_\_ FWL \_\_\_\_\_ FSL \_\_\_\_\_

File No. CP-750 Use OWD Location No. 20-34-7-4300



# WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

[www.ose.state.nm.us](http://www.ose.state.nm.us)

1. GENERAL AND WELL LOCATION	OSE POD NO. (WELL NO.) POD1 (BH-01)		WELL TAG ID NO. n/a		OSE FILE NO(S). C-1860 CP-1860			
	WELL OWNER NAME(S) XTO Energy (Kyle Littrell)				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS 6401 Holiday Hill Dr.				CITY Midland	STATE TX	ZIP 79707	
	WELL LOCATION (FROM GPS)	DEGREES LATITUDE 32°	MINUTES 32'	SECONDS 15.33" N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND * DATUM REQUIRED: WGS 84			
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE SW SE Sec. 30 T20S R34E								
2. DRILLING & CASING INFORMATION	LICENSE NO. 1249		NAME OF LICENSED DRILLER Jackie D. Atkins			NAME OF WELL DRILLING COMPANY Atkins Engineering Associates, Inc.		
	DRILLING STARTED 02/25/2021		DRILLING ENDED 02/25/2021		DEPTH OF COMPLETED WELL (FT) temporary well material	BORE HOLE DEPTH (FT) 112	DEPTH WATER FIRST ENCOUNTERED (FT) n/a	
	COMPLETED WELL IS: <input type="checkbox"/> ARTESIAN <input checked="" type="checkbox"/> DRY HOLE <input type="checkbox"/> SHALLOW (UNCONFINED)					STATIC WATER LEVEL IN COMPLETED WELL (FT) n/a		
	DRILLING FLUID: <input type="checkbox"/> AIR <input type="checkbox"/> MUD ADDITIVES - SPECIFY:							
	DRILLING METHOD: <input type="checkbox"/> ROTARY <input type="checkbox"/> HAMMER <input type="checkbox"/> CABLE TOOL <input checked="" type="checkbox"/> OTHER - SPECIFY: Hollow Stem Auger							
	DEPTH (feet bgl)		BORE HOLE DIAM. (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
	FROM	TO						
	0	112	±6.5	Boring- HSA	--	--	--	--
3. ANNULAR MATERIAL	DEPTH (feet bgl)		BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT		
	FROM	TO						

FOR OSE INTERNAL USE

WR-20 WELL RECORD &amp; LOG (Version 06/30/17)

FILE NO. CP-1860	POD NO. 1	TRN NO. 682530
LOCATION 323 T20S R34E Sec 30	WELL TAG ID NO. NA	PAGE 1 OF 2




4. HYDROGEOLOGIC LOG OF WELL	DEPTH (feet bgl)		THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER- BEARING ZONES (gpm)
	FROM	TO				
	0	2	2	Caliche, tan, off-white, no odor, no stain, gravel, dry	Y ✓ N	
	2	6	4	Sand, brown, no odor, no stain, m-f, well sorted, trace silt, dry	Y ✓ N	
	6	15	9	Sandy clay, brown, moist, no odor, no stain, m-f, well sorted, no plasticity, no coh	Y ✓ N	
	15	21	6	Clayey sand, tan-brown, moist, no odor, no stain, m-f, well sorted, cohesive, low	Y ✓ N	
	21	--	--	Caliche w/ sand, tan, off-white, no odor, no stain, m-f grain, well sorted, dry	Y ✓ N	
	--	40	19	23-gravel caliche 37-increase in sand content	Y ✓ N	
	40	44	44	Sand w/ caliche, tan, brown, m-f grain, well sorted, no odor, no stain, dry	Y ✓ N	
	44	58	14	Sandstone, mod. consolidation, m-f grain, increasing caliche tan/brown, dry,	Y ✓ N	
	58	65	7	Clayey sand, brown, dry, m-f grain, well sorted, cohesive, medium plasticity	Y ✓ N	
	65	78	13	Claystone, no odor, no stain, high plasticity, cohesive, brown, moist	Y ✓ N	
	78	79	2	med-f grain sand stringer	Y ✓ N	
	79	108	29	Claystone, no odor, no stain, high plasticity, cohesive, brown, moist	Y ✓ N	
	108	109	1	fine grain sand stringer	Y ✓ N	
	109	112	3	Claystone, no odor, no stain, high plasticity, cohesive, brown, moist	Y ✓ N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: <input type="checkbox"/> PUMP <input type="checkbox"/> AIR LIFT <input type="checkbox"/> BAILER <input type="checkbox"/> OTHER - SPECIFY:					TOTAL ESTIMATED WELL YIELD (gpm): 0.00	

5. TEST; RIG SUPERVISION	WELL TEST	TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.
	MISCELLANEOUS INFORMATION: Temporary well materials removed and the soil boring backfilled using drill cuttings from total depth to ten feet below ground surface, then hydrated bentonite chips from ten feet below ground surface to surface. Logs adapted from WSP on-site geologist.	
PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE: Shane Eldridge		

6. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 30 DAYS AFTER COMPLETION OF WELL DRILLING:	
	Jackie D. Atkins	03/09/2021
SIGNATURE OF DRILLER / PRINT SIGNED NAME		DATE

FOR OSE INTERNAL USE

WR-20 WELL RECORD &amp; LOG (Version 06/30/2017)

FILE NO. CP-18 60	POD NO. 1	TRN NO. 682530
LOCATION 323 T205 R34E Sec 30	WELL TAG ID NO. NA	PAGE 2 OF 2

John R. D Antonio, Jr., P.E.  
State Engineer



Roswell Office  
1900 WEST SECOND STREET  
ROSWELL, NM 88201

**STATE OF NEW MEXICO  
OFFICE OF THE STATE ENGINEER**

Trn Nbr: 682530  
File Nbr: CP 01860  
Well File Nbr: CP 01860 POD1

Apr. 08, 2021

TACOMA MORRISSEY  
WSP USA  
3300 NORTH A STREET  
BLDG 1 #222  
MIDLAND, TX 79705

Greetings:

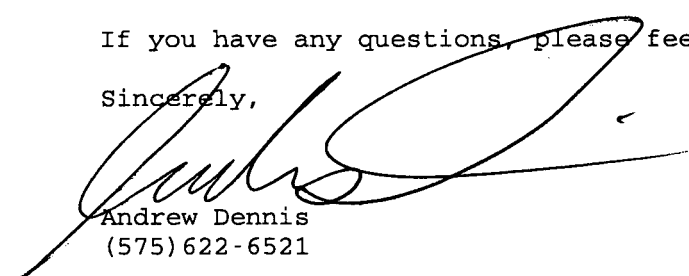
The above numbered permit was issued in your name on 12/01/2020.

The Well Record was received in this office on 03/11/2021, stating that it had been completed on 02/25/2021, and was a dry well. The well is to be plugged according to 19.27.4.30 NMAC.

Please note that another well can be drilled under this permit if the well is completed and the well log filed on or before 12/01/2021.

If you have any questions, please feel free to contact us.

Sincerely,

  
Andrew Dennis  
(575) 622-6521

drywell

Section 6. LOG OF HOLE

Depth in Feet		Thickness in Feet	Color and Type of Material Encountered
From	To		
0	6	6	sand
6	16	10	caleche
16	20	4	sand
20	22	2	rock (soft)
22	32	10	sand
32	65	33	sandy clay
65	102	37	red clay
102	107	5	blue sand rock
107	118	11	brown shale
118	127	9	blue sand rock
127	130	3	brown shale
130	154	24	blue sand rock
154	159	5	limestone hard
159	178	19	red clay
178	191	13	brown shale
191	210	19	red clay
210	235	25	brown shale
235	278	43	brown shale (some light blue)
278	295	17	purple shale (some light blue)
295	306	11	yellow and blue clay
306	320	14	red clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.



Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled. For the record, only Section 1(a) and Section 5 need be completed.





# WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

[www.ose.state.nm.us](http://www.ose.state.nm.us)

1. GENERAL AND WELL LOCATION	OSE POD NO. (WELL NO.) POD1 (BH-01)		WELL TAG ID NO. n/a		OSE FILE NO(S). CP-1884			
	WELL OWNER NAME(S) Ascent Energy				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS P.O Box 270983				CITY Littleton	STATE CO	ZIP 80127	
	WELL LOCATION (FROM GPS)	DEGREES LATITUDE 32	MINUTES 30	SECONDS 3.18 N	• ACCURACY REQUIRED: ONE TENTH OF A SECOND • DATUM REQUIRED: WGS 84			
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE SW SW SW Sec. 01 T21S R32E								
2. DRILLING & CASING INFORMATION	LICENSE NO. 1249		NAME OF LICENSED DRILLER Jackie D. Atkins			NAME OF WELL DRILLING COMPANY Atkins Engineering Associates, Inc.		
	DRILLING STARTED 09/08/2021		DRILLING ENDED 09/08/2021		DEPTH OF COMPLETED WELL (FT) temporary well material	BORE HOLE DEPTH (FT) 55	DEPTH WATER FIRST ENCOUNTERED (FT) n/a	
	COMPLETED WELL IS: <input type="checkbox"/> ARTESIAN <input checked="" type="checkbox"/> DRY HOLE <input type="checkbox"/> SHALLOW (UNCONFINED)					STATIC WATER LEVEL IN COMPLETED WELL (FT) n/a		
	DRILLING FLUID: <input type="checkbox"/> AIR <input type="checkbox"/> MUD ADDITIVES - SPECIFY:							
	DRILLING METHOD: <input type="checkbox"/> ROTARY <input type="checkbox"/> HAMMER <input type="checkbox"/> CABLE TOOL <input checked="" type="checkbox"/> OTHER - SPECIFY: Hollow Stem Auger							
	DEPTH (feet bgl) FROM TO		BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
	0 55		±6.5	Boring- HSA	--	--	--	--
3. ANNULAR MATERIAL	DEPTH (feet bgl) FROM TO		BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL		AMOUNT (cubic feet)	METHOD OF PLACEMENT	

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/30/17)


FILE NO. CP-1884	POD NO. 1	TRN NO. 699871
LOCATION 21S-32E-01 333	WELL TAG ID NO. N/A	PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL	DEPTH (feet bgl)		THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER- BEARING ZONES (gpm)
	FROM	TO				
	0	9	9	Sand, Medium/fine, with some caliche, Red	Y ✓ N	
	9	14	5	Sand, Medium/fine, with some caliche, Brown	Y ✓ N	
	14	24	10	Caliche with Medium/fine sand, Off white	Y ✓ N	
	24	34	10	Sand, Medium/fine, with some caliche, Brown	Y ✓ N	
	34	55	21	Caliche with Medium/fine sand, Off white	Y ✓ N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:					TOTAL ESTIMATED WELL YIELD (gpm): 0.00	
<input type="checkbox"/> PUMP <input type="checkbox"/> AIR LIFT <input type="checkbox"/> BAILER <input type="checkbox"/> OTHER - SPECIFY:						

5. TEST; RIG SUPERVISION	WELL TEST	TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.
	MISCELLANEOUS INFORMATION: Temporary well materials removed and the soil boring backfilled using drill cuttings from total depth to ten feet below ground surface, then hydrated bentonite chips from ten feet below ground surface to surface.	
	PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE: Shane Eldridge, Cameron Pruitt and Carmelo Trevino	

6. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 30 DAYS AFTER COMPLETION OF WELL DRILLING:	
	 Jackie D. Atkins	09/27/2021
SIGNATURE OF DRILLER / PRINT SIGNEE NAME		DATE

FOR OSE INTERNAL USE

WR-20 WELL RECORD &amp; LOG (Version 06/30/2017)

FILE NO. CP-1884	POD NO. 1	TRN NO. 699871
LOCATION 215-32E-01 333	WELL TAG ID NO. N/A	PAGE 2 OF 2



# WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

[www.ose.state.nm.us](http://www.ose.state.nm.us)

STATE ENGINEER OFFICE  
PO BOX 10000  
SANTA FE, NM 87505


1. GENERAL AND WELL LOCATION	OSE POD NUMBER (WELL NUMBER) 1				OSE FILE NUMBER(S) CP-1151			
	WELL OWNER NAME(S) Caza Operating LLC, Richard Wright				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS 200 North Lorraine				CITY Midland, Tx		STATE ZIP 79701	
	WELL LOCATION (FROM GPS)	DEGREES		MINUTES	SECONDS	* ACCURACY REQUIRED: ONE TENTH OF A SECOND * DATUM REQUIRED: WGS 84		
		LATITUDE		32	32			
	LONGITUDE		-103	38	3827 W			
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE N 1/2 Sec. 32 Township 22S Range 36E								
2. DRILLING & CASING INFORMATION	LICENSE NUMBER WD-1292		NAME OF LICENSED DRILLER Billy L. Bentley			NAME OF WELL DRILLING COMPANY Bentley Water Well Ser.		
	DRILLING STARTED 2-21-13	DRILLING ENDED 4-12-13	DEPTH OF COMPLETED WELL (FT)		BORE HOLE DEPTH (FT) 823	DEPTH WATER FIRST ENCOUNTERED (FT)		
	COMPLETED WELL IS: <input type="radio"/> ARTESIAN <input checked="" type="radio"/> DRY HOLE <input type="radio"/> SHALLOW (UNCONFINED)				STATIC WATER LEVEL IN COMPLETED WELL (FT)			
	DRILLING FLUID: <input type="radio"/> AIR <input checked="" type="radio"/> MUD ADDITIVES - SPECIFY:							
	DRILLING METHOD: <input type="radio"/> ROTARY <input type="radio"/> HAMMER <input checked="" type="radio"/> CABLE TOOL <input type="radio"/> OTHER - SPECIFY:							
	DEPTH (feet bgl)		BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
	FROM	TO						
	71	6	18	A-53B	PE	12 1/4	.250	-
	0	823	6	none dry hole				
3. ANNULAR MATERIAL	DEPTH (feet bgl)		BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT		
	FROM	TO						
	0	6	18	<del>A-53B</del> Cement	3	Tremie		
	0	823	6	Cement	340	Tremie		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	CP-1151	POD NUMBER	1	TRN NUMBER	520275
LOCATION	OWD	225.35E.35.222			PAGE 1 OF 2



4. HYDROGEOLOGIC LOG OF WELL	DEPTH (feet bgl)		THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER- BEARING ZONES (gpm)
	FROM	TO				
	0	3	3	Top soil	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	3	11	8	Caliche	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	11	20	9	Sandy Clay	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	20	28	8	Dry Sand	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	28	31	3	Rock	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	31	53	22	Red Sandy Clay	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	53	131	78	Red Bed	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	131	162	31	Lime	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	162	193	31	Sand	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	193	260	67	Red Bed	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	260	336	76	Rock	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	336	484	148	Red Bed w/sand stringers	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	484	519	35	Red & Blue Clay	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	519	529	10	Sand	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	529	543	14	Hard Red & Blue Clay	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	543	638	95	Red & Blue clay w/tight sand stringers	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	638	730	92	Red & Blue clay	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	730	732	2	Rock	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
	732	823	91	Red Bed	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
					<input type="checkbox"/> Y <input type="checkbox"/> N	
					<input type="checkbox"/> Y <input type="checkbox"/> N	
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: <input type="checkbox"/> PUMP					TOTAL ESTIMATED WELL YIELD (gpm):	
<input checked="" type="checkbox"/> AIRLIFT <input type="checkbox"/> BAILER <input type="checkbox"/> OTHER - SPECIFY:					Dry	
5. TEST; RIG SUPERVISION	WELL TEST	TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.				
	MISCELLANEOUS INFORMATION:					
	PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ON-SITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:					
6. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:  Billy BANTLER 4-21-13 SIGNATURE OF DRILLER / PRINT SIGNEE NAME DATE					

FOR OSE INTERNAL USE

WR-20 WELL RECORD &amp; LOG (Version 06/08/2012)

FILE NUMBER CP-1151

POD NUMBER 1

TRN NUMBER 520275

LOCATION DWD

225.35E.35.222

PAGE 2 OF 2

## Locator Tool Report

### General Information:

Application ID: 29      Date: 02-24-2017      Time: 10:27:10

WR File Number: CP-01151  
Purpose: POINT OF DIVERSION

Applicant First Name: RANDALL  
Applicant Last Name: HICKS

GW Basin: CAPITAN  
County: LEA

Critical Management Area Name(s): NONE  
Special Condition Area Name(s): NONE  
Land Grant Name: NON GRANT

### PLSS Description (New Mexico Principal Meridian):

SE 1/4 of SE 1/4 of NW 1/4 of SE 1/4 of Section 27, Township 20S, Range 33E.

### Coordinate System Details:

Geographic Coordinates: *Well Drillers Lat and Long*

( Latitude: 32 Degrees 32 Minutes 26.8 Seconds N  
Longitude: 103 Degrees 38 Minutes 49.6 Seconds W )

### Universal Transverse Mercator Zone: 13N

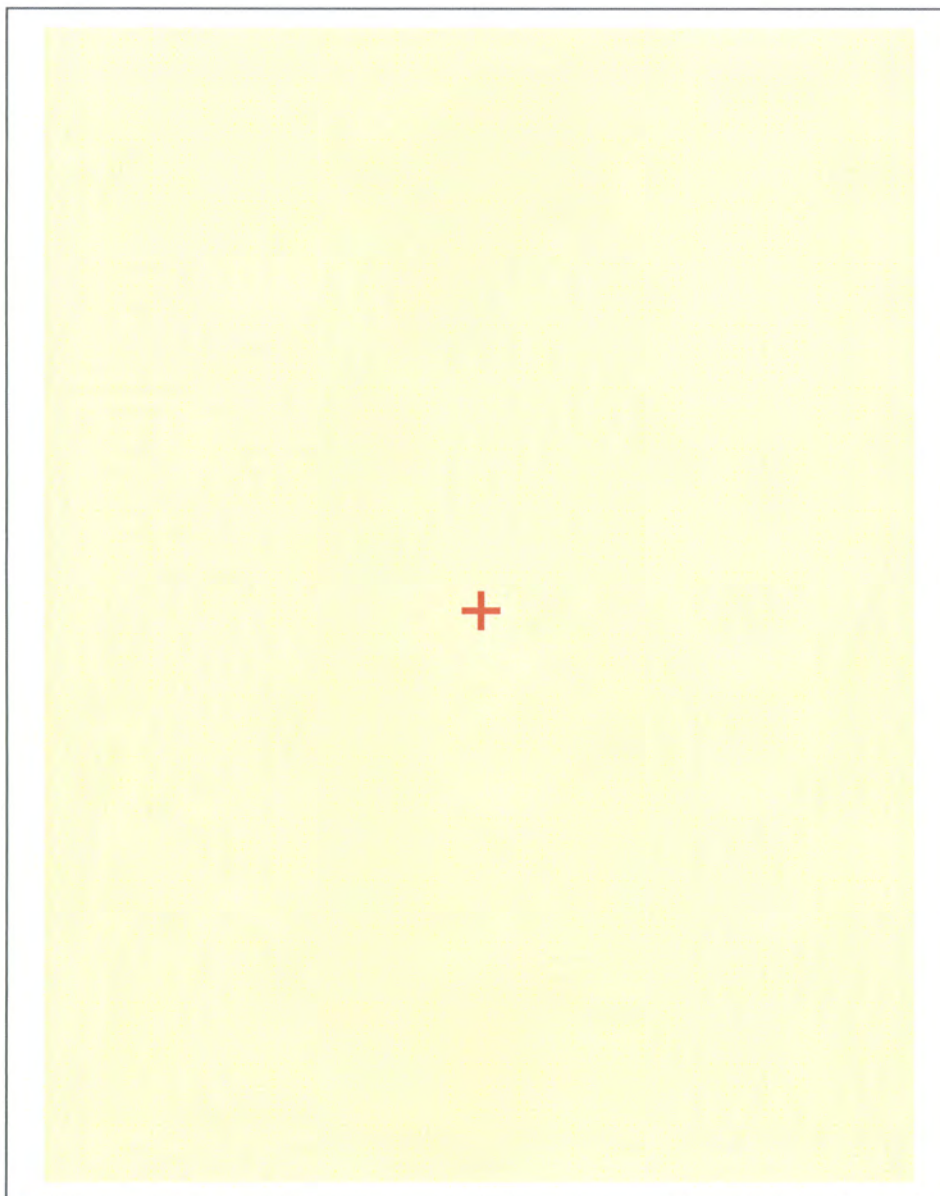
NAD 1983(92) (Meters)	N: 3,601,185	E: 627,036
NAD 1983(92) (Survey Feet)	N: 11,814,888	E: 2,057,202
NAD 1927 (Meters)	N: 3,600,982	E: 627,086
NAD 1927 (Survey Feet)	N: 11,814,223	E: 2,057,363

### State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 171,037	E: 229,454
NAD 1983(92) (Survey Feet)	N: 561,143	E: 752,801
NAD 1927 (Meters)	N: 171,018	E: 216,902
NAD 1927 (Survey Feet)	N: 561,081	E: 711,620

**NEW MEXICO OFFICE OF STATE ENGINEER**

**Locator Tool Report**



WR File Number: CP-01151

Scale: 1:57,473

Northing/Easting: UTM83(92) (Meter): N: 3,601,185

E: 627,036

Northing/Easting: SPCS83(92) (Feet): N: 561,143

E: 752,801

GW Basin: Capitan



Scott A. Verhines, P.E.  
State Engineer



well Office  
1900 WEST SECOND STREET  
ROSWELL, NM 88201

**STATE OF NEW MEXICO  
OFFICE OF THE STATE ENGINEER**

Trn Nbr: 520275  
File Nbr: CP 01151  
Well File Nbr: CP 01151 POD1

Apr. 29, 2013

RANDALL T HICKS  
CAZA OPERATING LLC  
901 RIO GRANDE NW, F-142  
ALBUQUERQUE, NM 87104

Greetings:

The above numbered permit was issued in your name on 01/22/2013.

The Well Record was received in this office on 04/24/2013, stating that it had been completed on 04/12/2013, and was a dry well. The well is to be plugged or capped or otherwise maintained in a manner satisfactory to the State Engineer.

Please note that another well can be drilled under this permit if the well is completed and the well log filed on or before 01/31/2014.

If you have any questions, please feel free to contact us.

Sincerely,

A handwritten signature in black ink, appearing to read "Y Mendiola".

Yolanda Mendiola  
(575) 622-6521

**USGS 323335103370601 20S.33E.24.12411 AKA USGS-15528**

Lea County, New Mexico

Hydrologic Unit Code 13060011

Latitude 32°33'35", Longitude 103°37'06"

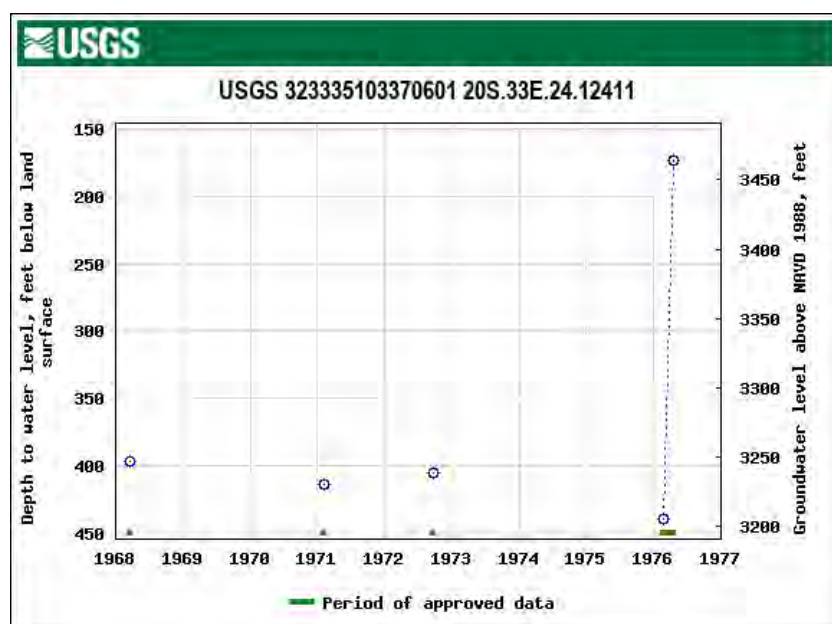
NAD27

Land-surface elevation 3,641 feet above  
NAVD88

The depth of the well is 676 feet below land  
surface.

This well is completed in the Other aquifers  
(N9999OTHER) national aquifer.

This well is completed in the Santa Rosa  
Sandstone (231SNRS) local aquifer.

**USGS 323341103403501 20S.33E.20.22224 AKA USGS-15411**

Lea County, New Mexico

Hydrologic Unit Code 13060011

Latitude 32°33'55", Longitude 103°40'38"

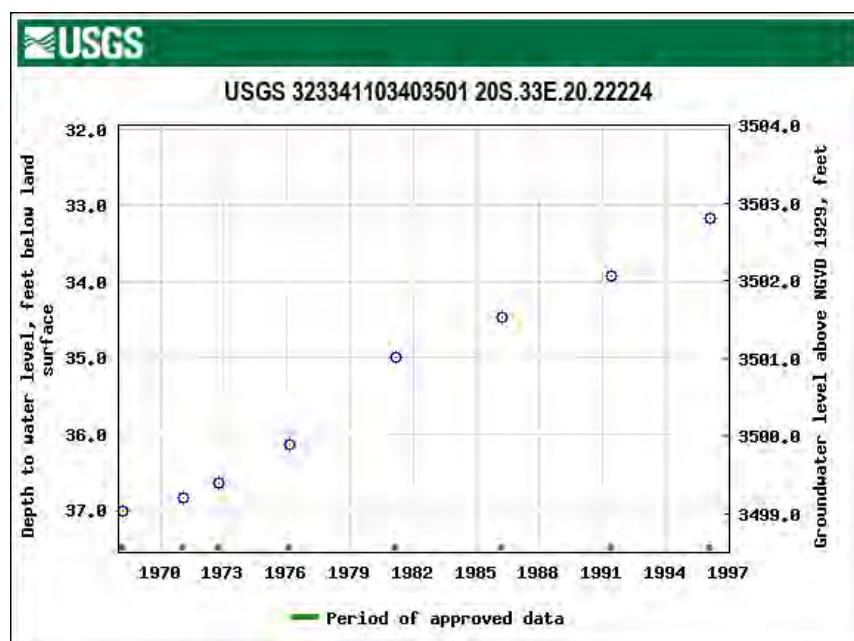
NAD27

Land-surface elevation 3,536.00 feet above  
NGVD29

The depth of the well is 52 feet below land  
surface.

This well is completed in the Other aquifers  
(N9999OTHER) national aquifer.

This well is completed in the Alluvium, Bolson  
Deposits and Other Surface Deposits  
(110AVMB) local aquifer.



**USGS 323442103384101 20S.33E.15.22143 AKA USGS-15121**

Lea County, New Mexico

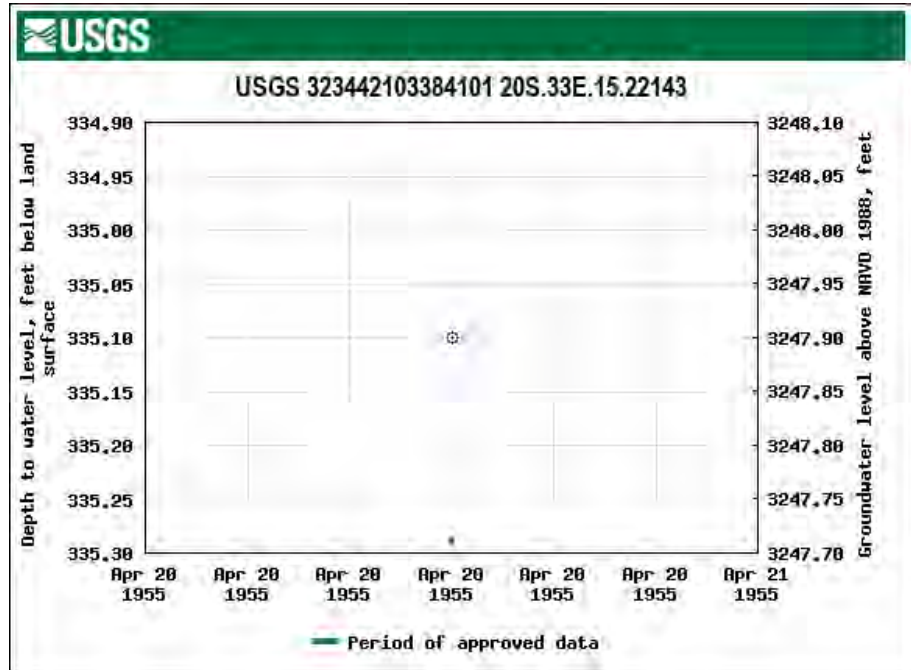
Hydrologic Unit Code 13060011

Latitude 32°34'42", Longitude 103°38'41"  
NAD27

Land-surface elevation 3,583 feet above  
NAVD88

This well is completed in the Other aquifers  
(N9999OTHER) national aquifer.

This well is completed in the Santa Rosa  
Sandstone (231SNRS) local aquifer.





## APPENDIX SITE PHOTOGRAPHS

**R.T. HICKS CONSULTANTS, LTD.*****Figures***

The figures below are from Hicks Consultants site visit of June 21, 2023.

**Figure 1:** View is to the west from the northeast corner of the site. The dune sand nature of the site is apparent.



**Figure 2:** Looking to the east from the northwestern corner of the Lone Ranger site. The power lines run east-west about 150 feet north of the site boundary.



**R.T. HICKS CONSULTANTS, LTD.**

**Figure 3:** Looking west from the northwestern corner of the site into the adjacent terrain.



**Figure 4:** Looking west-southwest from the southwest corner of the site.





**R.T. HICKS CONSULTANTS, LTD.**

**Figure 5:** View is to the north from the southeast corner of the site.



**Venegas, Victoria, EMNRD**

---

**From:** Venegas, Victoria, EMNRD  
**Sent:** Thursday, November 30, 2023 11:40 AM  
**To:** Nate Alleman; taylor@deepriverresources.com  
**Subject:** 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362]  
**Attachments:** C-147 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362].pdf

**1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362]**

Goor afternoon Mr. Alleman,

NMOCD has reviewed the recycling containment permit application and related documents, submitted by [332067] Ranger Water, LLC on November 22, 2023, for 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362] in P-22-20S-33E, Lea County, New Mexico.

The form C-147 and related documents for the 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362] is approved with the following conditions of conditions of approval:

- The purpose of this permit is for oil and gas activities regulated under the NMAC 19.15.34.3 STATUTORY AUTHORITY: 19.15.34 NMAC is adopted pursuant to the Oil and Gas Act, Paragraph (15) of Section 70-2-12(B) NMSA 1978, which authorizes the division to regulate the disposition of water produced or used in connection with the drilling for or producing of oil and gas or both and Paragraph (21) of Section 70-2-12(B) NMSA 1978 which authorizes the regulation of the disposition of nondomestic wastes from the exploration, development, production or storage of crude oil or natural gas.
- [332067] Ranger Water, LLC shall construct, operate, maintain, close, and reclaim the 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362] in compliance with 19.15.34 NMAC.
- 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362] is approved for five years of operations from the date of permit application. 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362] permit expires on November 22, 2028.
- The 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362] will consist of one (1) earthen impoundment with a capacity of 1,016,000.00 bbl.
- The total closure cost estimate for 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362], included in the application, in the amount of \$598,473.75 meets the requirements of NMAC 19.15.34.15.A.(1). The financial assurance should be mailed to the Oil Conservation Division; Bonding and Compliance; 1220 South St Frances Drive; Santa Fe, NM 87505. [332067] Ranger Water, LLC cannot receive produced water in the 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362] until after the original copy of the financial assurance has been accepted by NMOCD.
- [332067] Ranger Water, LLC shall notify NMOCD when construction of the 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362] commences.
- [332067] Ranger Water, LLC shall notify NMOCD when recycling operations commence and cease at 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362].
- A minimum of 3-feet freeboard must be maintained 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362] recycling containment, at all times during operations.
- If less than 20% of the total fluid capacity is utilized every six months, beginning from the first withdrawal, operation of the facility is considered ceased and a notification of cessation of operations should be sent electronically to [OCD Online](#). An extension to extend the cessation of operation, not to exceed six months, must be submitted using a C-147 form through [OCD Online](#).
- [332067] Ranger Water, LLC must submit monthly reports of recycling and reuse of produced water, drilling fluids, and liquid oil field waste on NMOCD form C-148 through [OCD Online](#) even if there is zero activity.
- [332067] Ranger Water, LLC shall comply with 19.15.29 NMAC Releases in the event of any release of produced water or other oil field wastes at 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362].

Please reference number 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362] in all future communications.

**NOTE:** For your next submittals, please use the updated C-147 Long:

[https://www.emnrd.nm.gov/oed/wp-content/uploads/sites/6/Updated\\_C-147LongFINAL4-3-17.pdf](https://www.emnrd.nm.gov/oed/wp-content/uploads/sites/6/Updated_C-147LongFINAL4-3-17.pdf)

Regards,

**Victoria Venegas** • Environmental Specialist

Environmental Bureau

EMNRD - Oil Conservation Division

506 W. Texas Ave. Artesia, NM 88210

(575) 909-0269 | [Victoria.Venegas@emnrd.nm.gov](mailto:Victoria.Venegas@emnrd.nm.gov)

<https://www.emnrd.nm.gov/oed/>





**District I**  
1625 N. French Dr., Hobbs, NM 88240  
Phone:(575) 393-6161 Fax:(575) 393-0720  
**District II**  
811 S. First St., Artesia, NM 88210  
Phone:(575) 748-1283 Fax:(575) 748-9720  
**District III**  
1000 Rio Brazos Rd., Aztec, NM 87410  
Phone:(505) 334-6178 Fax:(505) 334-6170  
**District IV**  
1220 S. St Francis Dr., Santa Fe, NM 87505  
Phone:(505) 476-3470 Fax:(505) 476-3462

**State of New Mexico**  
**Energy, Minerals and Natural Resources**  
**Oil Conservation Division**  
**1220 S. St Francis Dr.**  
**Santa Fe, NM 87505**

CONDITIONS  
  
Action 287860

CONDITIONS

Operator:  Ranger Water, LLC P.O. Box 1244 Lovington, NM 88260	OGRID:  332067
	Action Number:  287860
	Action Type:  [C-147] Water Recycle Long (C-147L)

CONDITIONS

Created By	Condition	Condition Date
vvenegas	The form C-147 and related documents for the 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362] is approved with the following conditions of conditions of approval: • [332067] Ranger Water, LLC shall construct, operate, maintain, close, and reclaim the 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362] in compliance with 19.15.34 NMAC. • 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362] permit expires on November 22, 2028. • [332067] Ranger Water, LLC shall comply with 19.15.29 NMAC Releases in the event of any release of produced water or other oil field wastes at 1RF-512 - RANGER RF & CONTAINMENTS FACILITY ID [fVV2333436362].	11/30/2023